

DIPLOMADO DE PROFUNDIZACION CISCO CCNP

EVALUACION – PRUEBA DE HABILIDADES PRACTICAS CCNP

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**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD
ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA
INGENIERIA DE TELECOMUNICACIONES**

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DEDICATORIA

Primeramente, Quiero expresarle toda mi gratitud a Dios quien ha permitido que todo en cuanto hago en la vida me sea posible, también quiero agradecer a toda mi familia por siempre estar presentes en mi vida y apoyarme cuando estuve a punto de desfallecer.

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Introduccion

Dentro de la ingenieria de telecomunicaciones es fundamental el conocer el funcionamiento y configuracion de los perifericos mas importantes y fundamentales como lo son los Siwtch y Router, es por ello que dentro del presente archivo documentaremos las practicas realizadas, en busca de aplicar todo el conocimiento adquirido dentro del diplomado Cisco CCNP. Dicho diplomado nos permitio establecer las bases de configuracion de los diferentes dispositivos de comunicaciones y logramos identificar lo fundamental de aplicar una buena configuracion teniendo en cuenta que, se nos presenta un si numero de oportunidades de mejora, en la infraestructura, seguridad y calidad de nuestra red de datos.

Teniendo en cuenta todo el conocimiento adquirido realizaremos algunas configuraciones basicas que nos permitiran tener muy en claro como debe establecensen los controles del protocolo OSFP o de una vlan implementada a nivel de switch en nuestra infraestructura .

Objetivo Principal

Aplicar los conocimientos recogidos durante la realización del diplomado de profundización Cisco CCNP por medio de la aplicación de habilidades prácticas.

Objetivos Específicos

- Aplicar las configuraciones mínimas a un Router y Switch dentro de nuestras prácticas y redes de datos
- Establecer reglas de conectividad dentro de los periféricos con el fin de permitir o no el flujo de datos
- Conocer la información básica aplicada a los protocolos OSPF aplicado a nuestros Router.
- Establecer la configuración VLAN a nuestro Switch en busca de las redes locales y establecer las troncales para su conexión

Desarrollo de los tres escenarios

Escenario 1

No se encuentran elementos de tabla de ilustraciones.

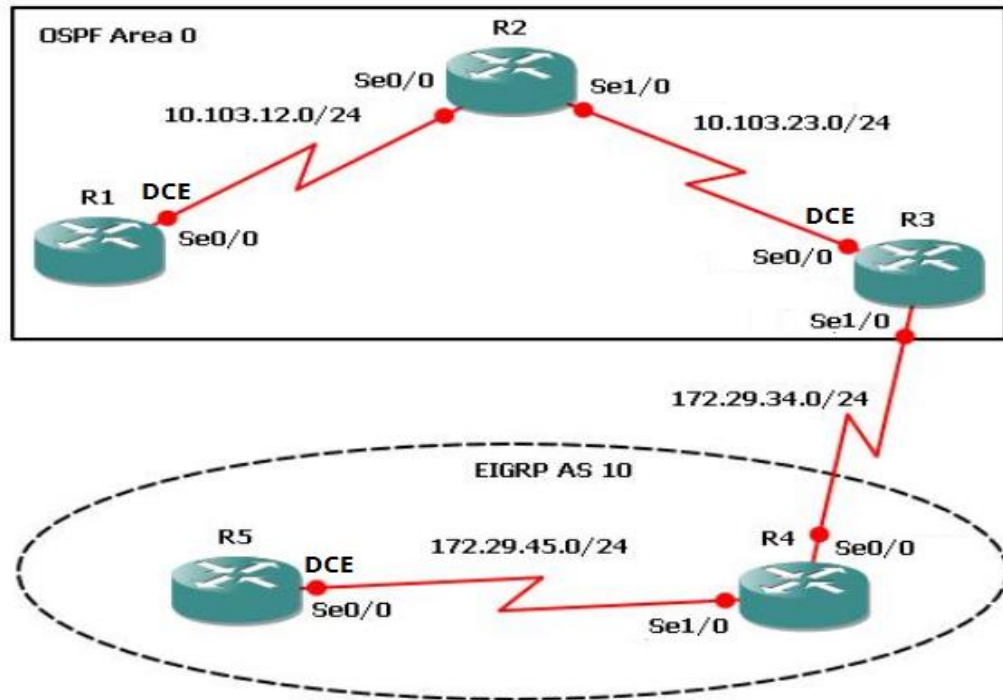


Figura 1. Escenario 1

1. Aplique las configuraciones iniciales y los protocolos de enrutamiento para los routers R1, R2, R3, R4 y R5 según el diagrama. No asigne passwords en los routers. Configurar las interfaces con las direcciones que se muestran en la topología de red.

Aplicamos la configuración del R1

```
R1(config)#no ip domai
R1(config)#no ip domain-lookup
R1(config)#line con 0
R1(config-line)#log
R1(config-line)#logg
R1(config-line)#logging sync
R1(config-line)#logging synchronous
```

```
R1(config-line)#exce
R1(config-line)#exec
R1(config-line)#exec-timeout 0 0
R1(config-line)#
R1(config-line)#exi
R1(config)#inter
R1(config)#interface lo
R1(config)#interface loopback 1
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state
to up
```

```
R1(config-if)#inter
R1(config-if)#interfas
R1(config-if)#inter
R1(config-if)#interfa
R1(config-if)#interface
R1(config-if)#interface ser
R1(config-if)#interface serial 0/0/0
R1(config-if)#ip address 10.103.12.2 255.255.255.0
R1(config-if)#
R1(config-if)#clock rate 128000
R1(config-if)#no shu
```

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

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

```
R1#config ter
R1#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router
R1(config)#router os
R1(config)#router ospf 1
R1(config-router)#router
R1(config-router)#router-id 1.1.1.1
R1(config-router)#netq
R1(config-router)#netw
R1(config-router)#network 10.1.0.0 0.0.3.255 area 0
R1(config-router)#network 10.103.12.0 0.0.0.255 area 0
```

```
R1(config-router)#exi
R1(config)#exi
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#copy ru st
Destination filename [startup-config]?
Building configuration...
[OK]
R1#
```

Aplicamos la configuración del R2

```
Router>enable
Router#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#line con 0
Router(config-line)#
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0 0
Router(config-line)#exit
Router(config)#interface loopback 2
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface Loopback2, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback2, changed state
to up
```

```
Router(config-if)#interface serial 0/0/0
Router(config-if)#ip address 10.103.12.1 255.255.255.0
Router(config-if)#no shu
```

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

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

```
Router(config-if)#interface serial 0/0/1
Router(config-if)#interface serial 0/0/1
Router(config-if)#
Router(config-if)#ip address 10.103.23.2 255.255.255.0
```

```

Router(config-if)#
Router(config-if)#no shu

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#exi
Router(config)#router
Router(config)#router ospf 1
Router(config-router)#router-id 2.2.2.2
Router(config-router)#network 10.103.12.0 0.0.0.255 area 0
Router(config-router)#
00:12:19: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/0 from LOADING
to FULL, Loading Done

Router(config-router)#network 10.103.23.0 0.0.0.255 area 0
Router(config-router)#
Router(config-router)#exi
Router(config)#exi
Router#
%SYS-5-CONFIG_: Configured from console by console

Router#soscopy ru st
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#
R2(config)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

```

Aplicamos la configuración del R3

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#line con 0
R3(config-line)#logging synchronous
R3(config-line)#exec-timeout 0 0

```

```
R3(config-line)#exi
R3(config)#interface loopback 3
```

```
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback3, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback3, changed state
to up
```

```
R3(config-if)#interface serial 0/0/1
R3(config-if)#ip address 10.103.23.1 255.255.255.0
R3(config-if)#clock rate 128000
This command applies only to DCE interfaces
R3(config-if)#exi
R3(config)#inter
R3(config)#interface lop
R3(config)#interface loop
R3(config)#interface loopback 3
R3(config-if)#inter
R3(config-if)#interfa
R3(config-if)#interface
R3(config-if)#interface serial 0/0/1
R3(config-if)#ip address 10.103.23.1 255.255.255.0
R3(config-if)#clock rate 128000
This command applies only to DCE interfaces
R3(config-if)#no shu
```

```
R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
```

```
R3(config-if)#exi
R3(config)#int
% Incomplete command.
R3(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state
to up
```

```
R3(config)#interface loopback 3
R3(config-if)#interface serial 0/0/0
R3(config-if)#ip address 172.29.34.2 255.255.255.0
R3(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R3(config-if)#exi
R3(config)#exi
```

```

R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#en
R3#config
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#router-id 3.3.3.3
R3(config-router)#network 10.103.23.0 0.0.0.255 area 0
R3(config-router)#exio
^
% Invalid input detected at '^' marker.
R3(config-router)#exi
R3(config)#exi
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#copy
R3#copy run
R3#copy running-config
00:35:43: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from LOADING
to FULL, Loading Done

R3#copy running-config sta
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#
%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

```

Aplicamos la configuración del R4

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R4
R4(config)#

```

```
R4(config)#no ip domain-lookup
R4(config)#line con 0
R4(config-line)#logging synchronous
R4(config-line)#exec-timeout 0 0
R4(config-line)#exit
R4(config)#interface loopback 4
```

```
R4(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
```

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

```
R4(config-if)#interface serial 0/0/0
R4(config-if)#
R4(config-if)#ip address 172.29.34.1 255.255.255.0
R4(config-if)#
R4(config-if)#no shut
```

```
R4(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
R4(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state
to up
```

```
R4(config-if)#interface serial 0/0/1
R4(config-if)#ip address 172.29.45.2 255.255.255.0
R4(config-if)#no shut
```

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

```
R4(config-if)#exi
R4(config)#exi
R4#
%SYS-5-CONFIG_I: Configured from console by console
```

```
R4#copy run
R4#copy running-config s
R4#copy running-config star
R4#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R4#
%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

Aplicamos la configuración del R5

```
Router>ena
Router#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#no ip domain-lookup
Router(config)#
Router(config)#line con
Router(config)#line con 0
Router(config-line)#logging synchronous
Router(config-line)#exec-timeout 0 0
Router(config-line)#
Router(config-line)#exit
Router(config)#interface loopback 5
```

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

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

```
Router(config-if)#interface serial 0/0/0
Router(config-if)#interface serial 0/0/1
Router(config-if)#ip address 172.29.45.1 255.255.255.0
Router(config-if)#clock rate 128000
This command applies only to DCE interfaces
Router(config-if)#no shut
```

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

```
Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
```

```
e
Router(config-if)#exi
Router(config)#exi
Router#
```

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

```
Router#copy run
Router#copy running-config st
Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R5
R5(config)#
```

2. Cree cuatro nuevas interfaces de Loopback en R1 utilizando la asignación de direcciones 10.1.0.0/22 y configure esas interfaces para participar en el área 0 de OSPF.

Tabla 1. Interface Loopback R1 Escenario1

INTERFACE LOOPBACK R1	
Loopback6	10.1.0.1/22
Loopback7	10.1.2.1/22
Loopback8	10.1.3.1/22
Loopback9	10.1.4.1/22

```
R1#
R1#ena
R1#config
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#inter
R1(config)#interface loop
R1(config)#interface loopback 6

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up

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

R1(config-if)#ip add
R1(config-if)#ip address 10.1.0.1 255.255.255.0
R1(config-if)#exi
```

```
R1(config)#inter
R1(config)#interface lop
R1(config)#interface loop
R1(config)#interface loopback 7
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback7, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback7, changed state
to up
```

```
R1(config-if)#ip ad
R1(config-if)#ip address 10.1.2.1 255.255.255.0
R1(config-if)#exi
R1(config)#inter
R1(config)#interface lop
R1(config)#interface loop
R1(config)#interface loopback 8
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback8, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback8, changed state
to up
```

```
R1(config-if)#ip ad
R1(config-if)#ip address 10.1.3.1 255.255.255.0
R1(config-if)#exi
R1(config)#inter
R1(config)#interface lop
R1(config)#interface loop
R1(config)#interface loopback 9
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback9, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback9, changed state
to up
```

```
R1(config-if)#ip ad
R1(config-if)#ip address 10.1.4.1 255.255.255.0
R1(config-if)#exi
R1(config)#
R1(config)#
R1(config)#rout
```

```
R1(config)#router ospf
R1(config)#router ospf 1
R1(config-router)#router
R1(config-router)#router-id 1.1.1.1
R1(config-router)#net
R1(config-router)#network 10.1.0.0 0.0.3.255 area 0
R1(config-router)#net
R1(config-router)#network 10.103.12.0
% Incomplete command.
R1(config-router)#exi
R1(config)#rout
R1(config)#router ospf
R1(config)#router ospf 1
R1(config-router)#net
R1(config-router)#network 10.103.12.0 0.0.0.255 area 0
R1(config-router)#exi
R1(config)#exi
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

```
R1#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface lo
R1(config)#interface loopback 6
R1(config-if)#ip ois
R1(config-if)#ip os
R1(config-if)#ip ospf net
R1(config-if)#ip ospf network po
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exi
R1(config)#interface loopback 7
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exi
R1(config)#interface loopback 8
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exi
R1(config)#interface loopback 9
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exi
R1(config)#exi
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

```
R1#copy run
```

```

R1#copy running-config sta
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK

```

3. Cree cuatro nuevas interfaces de Loopback en R5 utilizando la asignación de direcciones 172.5.0.0/22 y configure esas interfaces para participar en el Sistema Autónomo EIGRP 10.

Tabla 2. Interface Loopback R5 Escenario 1.

INTERFACE LOOPBACK R5	
Loopback16	172.5.0.1/22
Loopback17	172.5.4.1/22
Loopback18	172.5.8.1/22
Loopback19	172.5.12.1/22

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback19, changed state to up

```

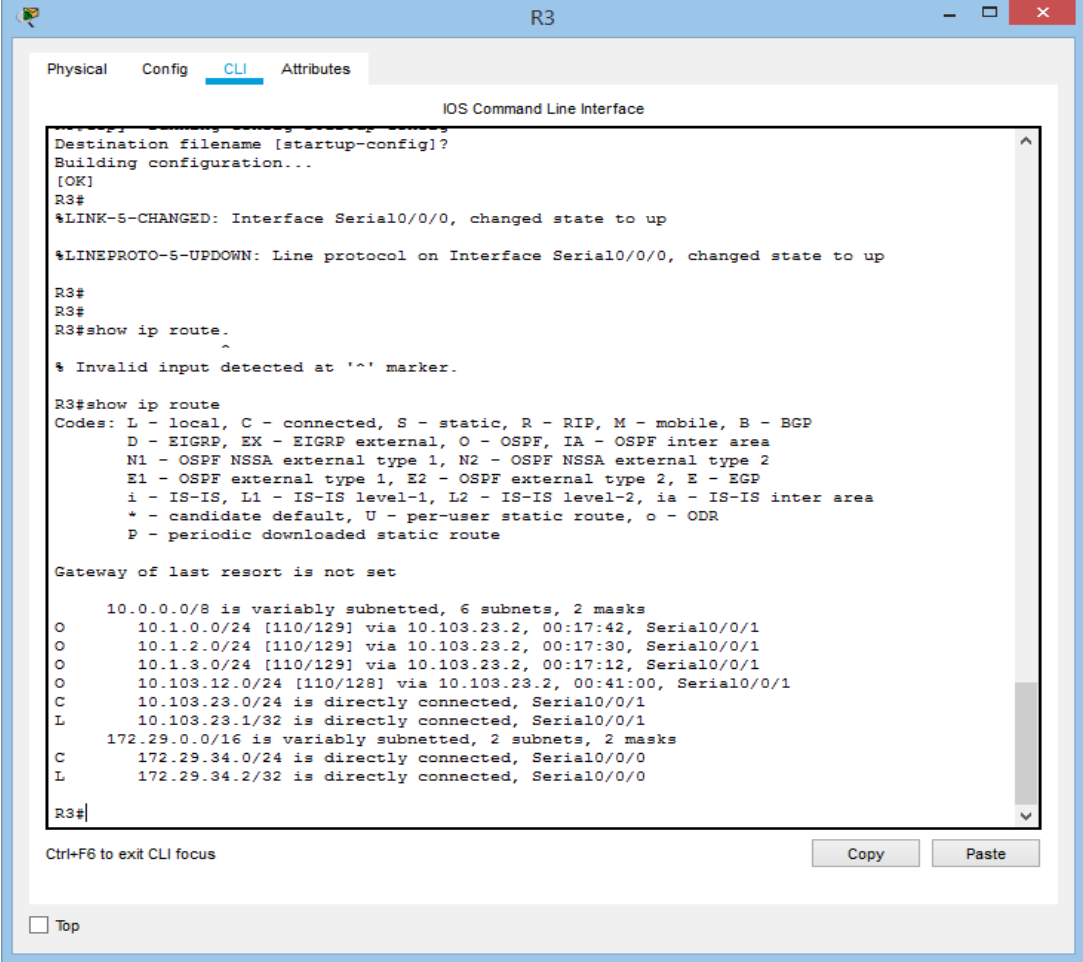
R5(config-if)#exi
R5(config)#interface loopback 16
R5(config-if)#ip address 172.5.0.1 255.255.252.0
R5(config-if)#exi
R5(config)#interface loopback 17
R5(config-if)#ip address 172.5.4.1 255.255.252.0
R5(config-if)#exi
R5(config)#interface loopback 18
R5(config-if)#ip address 172.5.8.1 255.255.252.0
R5(config-if)#exi
R5(config)#interface loopback 19
R5(config-if)#ip address 172.5.12.1 255.255.252.0
R5(config-if)#exi
R5(config)#route
R5(config)#route eig
R5(config)#route eigrp 10
R5(config-router)#aut
R5(config-router)#auto-summary
R5(config-router)#net
R5(config-router)#network 172.5.0.0 0.0.3.255
R5(config-router)#network 172.29.45.0 0.0.0.255
R5(config-router)#exi
R5(config)#exi

```

```
R5#  
%SYS-5-CONFIG_I: Configured from console by console
```

```
R5#copy run  
R5#copy running-config sta  
R5#copy running-config startup-config  
Destination filename [startup-config]?  
Building configuration...  
[OK]
```

4. Analice la tabla de enrutamiento de R3 y verifique que R3 está aprendiendo las nuevas interfaces de Loopback mediante el commando **show ip route**.



```
R3  
Physical Config CLI Attributes  
IOS Command Line Interface  
Destination filename [startup-config]?  
Building configuration...  
[OK]  
R3#  
%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  
  
R3#  
R3#  
R3#show ip route.  
^  
% Invalid input detected at '^' marker.  
  
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  
  
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks  
O 10.1.0.0/24 [110/129] via 10.103.23.2, 00:17:42, Serial0/0/1  
O 10.1.2.0/24 [110/129] via 10.103.23.2, 00:17:30, Serial0/0/1  
O 10.1.3.0/24 [110/129] via 10.103.23.2, 00:17:12, Serial0/0/1  
O 10.103.12.0/24 [110/128] via 10.103.23.2, 00:41:00, Serial0/0/1  
C 10.103.23.0/24 is directly connected, Serial0/0/1  
L 10.103.23.1/32 is directly connected, Serial0/0/1  
L 172.29.0.0/16 is variably subnetted, 2 subnets, 2 masks  
C 172.29.34.0/24 is directly connected, Serial0/0/0  
L 172.29.34.2/32 is directly connected, Serial0/0/0  
  
R3#|  
Ctrl+F6 to exit CLI focus  
Copy Paste  
 Top
```

Figura 2. Tabla de enrutamiento R3

5. Configure R3 para redistribuir las rutas EIGRP en OSPF usando el costo de 50000 y luego redistribuya las rutas OSPF en EIGRP usando un ancho de banda T1 y 20,000 microsegundos de retardo.

```
R3(config)#router
R3(config)#router
R3(config)#router os
R3(config)#router ospf 10
R3(config-router)#redis
R3(config-router)#redistribute eig
R3(config-router)#redistribute eigrp 10 sub
R3(config-router)#redistribute eigrp 10 subnets
R3(config-router)#exi
R3(config)#router
R3(config)#router osp
R3(config)#router ospf 1
R3(config-router)#redis
R3(config-router)#redistribute ei
R3(config-router)#redistribute eigrp 10
% Only classful networks will be redistributed
R3(config-router)#redis
R3(config-router)#redistribute eig
R3(config-router)#redistribute eigrp 10 sub
R3(config-router)#redistribute eigrp 10 subnets
R3(config-router)#exi
R3(config)#router
R3(config)#router eig
R3(config)#router eigrp 10
R3(config-router)#redis
R3(config-router)#redistribute os
R3(config-router)#redistribute ospf 1
R3(config-router)#redistribute ospf 1 me
R3(config-router)#redistribute ospf 1 metric 154
R3(config-router)#redistribute ospf 1 metric 1544 100 255 1
% Incomplete command.
R3(config-router)#redistribute ospf 1 metric 1544 100 255 1
% Incomplete command.
R3(config-router)#redistribute ospf 1 metric 1544 100 255 1
% Incomplete command.
R3(config-router)#redistribute ospf 1 metric 1544 100 255 1 1500
R3(config-router)#exi
R3(config)#exi
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

```
R3#show{
```

```
R3#show ip
```

```
R3#show ip r
```

```
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
```

```
10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
```

```
O 10.1.0.0/24 [110/129] via 10.103.23.2, 00:21:25, Serial0/0/1
```

```
O 10.1.2.0/24 [110/129] via 10.103.23.2, 00:21:13, Serial0/0/1
```

```
O 10.1.3.0/24 [110/129] via 10.103.23.2, 00:20:55, Serial0/0/1
```

```
O 10.103.12.0/24 [110/128] via 10.103.23.2, 00:44:43, Serial0/0/1
```

```
C 10.103.23.0/24 is directly connected, Serial0/0/1
```

```
L 10.103.23.1/32 is directly connected, Serial0/0/1
```

```
172.29.0.0/16 is variably subnetted, 2 subnets, 2 masks
```

```
C 172.29.34.0/24 is directly connected, Serial0/0/0
```

```
L 172.29.34.2/32 is directly connected, Serial0/0/0
```

```
R3#conf
```

```
Configuring from terminal, memory, or network [terminal]? ter
```

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

```
R3(config)#router
```

```
R3(config)#router os
```

```
R3(config)#router ospf 1
```

```
R3(config-router)#net
```

```
R3(config-router)#network 172.29.34.0 0.0.0.255 are
```

```
R3(config-router)#network 172.29.34.0 0.0.0.255 area 0
```

```
R3(config-router)#exi
```

```
R3(config)#exi
```

```
R3#
```

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

```
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

10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
O 10.1.0.0/24 [110/129] via 10.103.23.2, 00:22:04, Serial0/0/1
O 10.1.2.0/24 [110/129] via 10.103.23.2, 00:21:52, Serial0/0/1
O 10.1.3.0/24 [110/129] via 10.103.23.2, 00:21:34, Serial0/0/1
O 10.103.12.0/24 [110/128] via 10.103.23.2, 00:45:22, Serial0/0/1
C 10.103.23.0/24 is directly connected, Serial0/0/1
L 10.103.23.1/32 is directly connected, Serial0/0/1
172.29.0.0/16 is variably subnetted, 2 subnets, 2 masks
C 172.29.34.0/24 is directly connected, Serial0/0/0
L 172.29.34.2/32 is directly connected, Serial0/0/0

R3#conf

Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.

R3(config)#route

R3(config)#router os

R3(config)#router ospf 1

R3(config-router)#redis

R3(config-router)#redistribute eig

R3(config-router)#redistribute eigrp 10 sub

R3(config-router)#redistribute eigrp 10 subnets

R3(config-router)#log

R3(config-router)#log-adjacency-changes

R3(config-router)#redis

R3(config-router)#redistribute ei

R3(config-router)#redistribute eigrp 7

R3(config-router)#redistribute eigrp 7 sub

R3(config-router)#redistribute eigrp 7 subnets

R3(config-router)#net

R3(config-router)#network 172.29.45.0 0.0.0.255 area 0

R3(config-router)#exi

R3(config)#router

R3(config)#router eig

R3(config)#router eigrp 10

R3(config-router)#redis

R3(config-router)#redistribute ospf 1 me

R3(config-router)#redistribute ospf 1 metric 50000 200 255 1 1500

^

% Invalid input detected at '^' marker.

```

R3(config-router)#redistribu
R3(config-router)#redistribute os
R3(config-router)#redistribute ospf 1
R3(config-router)#redistribute ospf 1 me
R3(config-router)#redistribute ospf 1 metric 50000 200 255 1 1500
R3(config-router)#aud
R3(config-router)#auto
R3(config-router)#auto-summary
R3(config-router)#exit

```

6. Verifique en R1 y R5 que las rutas del sistema autónomo opuesto existen en su tabla de enrutamiento mediante el comando **show ip route**.

```

R1
-----
Physical Config CLI Attributes
IOS Command Line Interface
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, 11 subnets, 2 masks
C 10.1.0.0/24 is directly connected, Loopback6
L 10.1.0.1/32 is directly connected, Loopback6
C 10.1.2.0/24 is directly connected, Loopback7
L 10.1.2.1/32 is directly connected, Loopback7
C 10.1.3.0/24 is directly connected, Loopback8
L 10.1.3.1/32 is directly connected, Loopback8
C 10.1.4.0/24 is directly connected, Loopback9
L 10.1.4.1/32 is directly connected, Loopback9
C 10.103.12.0/24 is directly connected, Serial0/0/0
L 10.103.12.2/32 is directly connected, Serial0/0/0
O 10.103.23.0/24 [110/128] via 10.103.12.1, 01:09:17, Serial0/0/0
O 172.29.0.0/24 is subnetted, 1 subnets
O 172.29.34.0/24 [110/192] via 10.103.12.1, 00:04:46, Serial0/0/0

R1#

```

Figura 3. Rutas de sistema autónomo R1

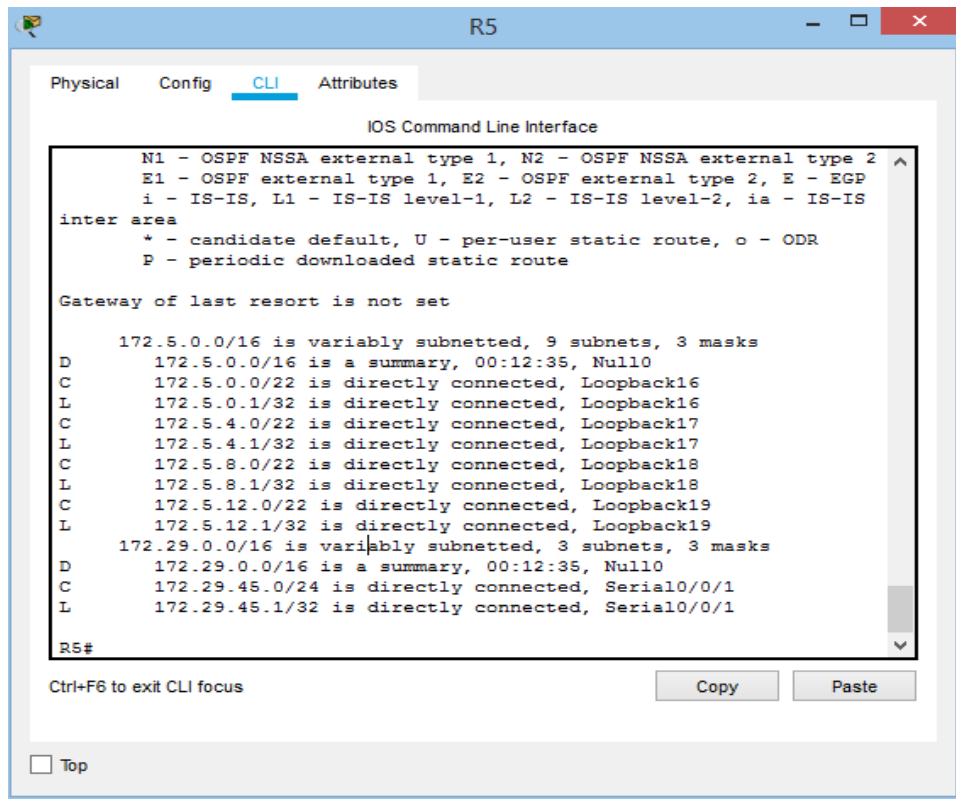


Figura 4. Rutas de sistema autónomo R1

Escenario 2

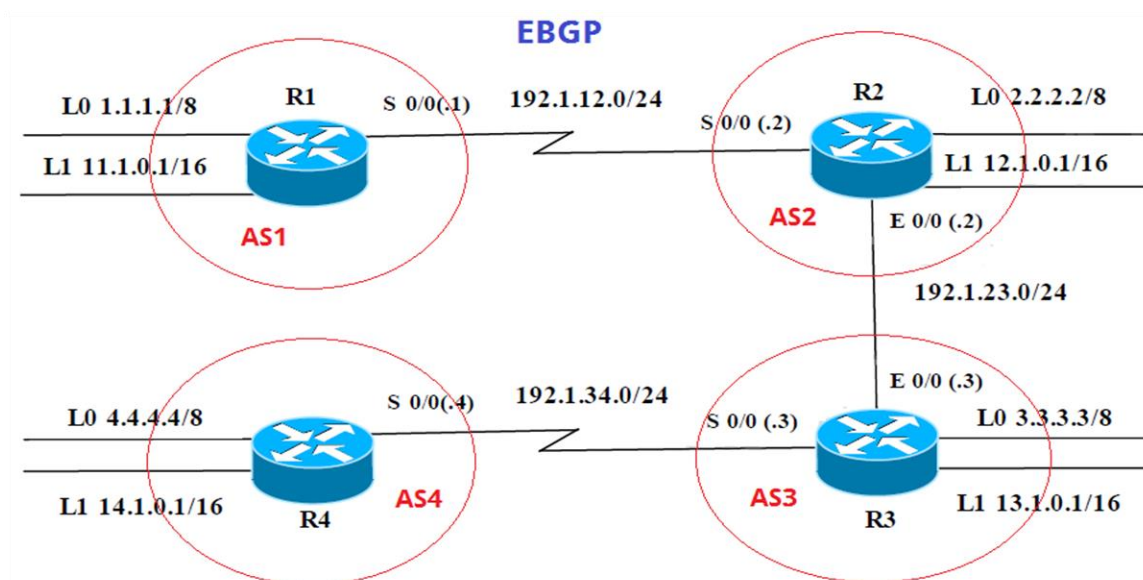


Figura 5. Escenario 2

Tabla 3. Interfaz Routers Escenario 2.

Interfaz R1	Dirección IP	Máscara
Loopback 0	1.1.1.1	255.0.0.0
Loopback 1	11.1.0.1	255.255.0.0
S 0/0	192.1.12.1	255.255.255.0
Interfaz R2	Dirección IP	Máscara
Loopback 0	2.2.2.2	255.0.0.0
Loopback 1	12.1.0.1	255.255.0.0
S 0/0	192.1.12.2	255.255.255.0
E 0/0	192.1.23.2	255.255.255.0
Interfaz R3	Dirección IP	Máscara
Loopback 0	3.3.3.3	255.0.0.0
Loopback 1	13.1.0.1	255.255.0.0
E 0/0	192.1.23.3	255.255.255.0
S 0/0	192.1.34.3	255.255.255.0

Interfaz R4	Dirección IP	Máscara
Loopback 0	4.4.4.4	255.0.0.0
Loopback 1	14.1.0.1	255.255.0.0
S 0/0	192.1.34.4	255.255.255.0

Configuración inicial router 1

Router>enable

Router#configure terminal

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

Router(config)#hostname R1

R1(config)#

R1(config)#

R1(config)#

R1(config)#inter

R1(config)#interface lo

R1(config)#interface loopback 0

R1(config-if)#

%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

R1(config-if)#ip ad

R1(config-if)#ip address 1.1.1.1 255.0.0.0

R1(config-if)#exit

R1(config)#inter

R1(config)#interface lop

R1(config)#interface loo

R1(config)#interface loopback 1

R1(config-if)#

%LINK-5-CHANGED: Interface Loopback1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up

R1(config-if)#ip ad

R1(config-if)#ip address 11.1.0.1 255.255.0.0

```
R1(config-if)#exi
R1(config)#inter
R1(config)#interface se
R1(config)#interface serial 0/0/0
R1(config-if)#ip ad
R1(config-if)#ip address 192.1.12.1 255.255.255.0
R1(config-if)#clo
R1(config-if)#clockra
R1(config-if)#clock ra
R1(config-if)#clock rate 64000
R1(config-if)#no shu
```

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

Configuración inicial router 2

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#
R2(config)#enab
R2(config)#enable
% Incomplete command.
R2(config)#int
R2(config)#interface lo
R2(config)#interface loopback 0
```

```
R2(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state
to up
```

```
R2(config-if)#ip ad
R2(config-if)#ip address 2.2.2.2 255.0.0.0
R2(config-if)#exit
R2(config)#inter
R2(config)#interface lop
R2(config)#interface loo
R2(config)#interface loopback 1
```

```
R2(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up

```
R2(config-if)#ip ad
R2(config-if)#ip address 12.1.0.1 255.255.0.0
R2(config-if)#exi
R2(config)#inter
R2(config)#interface ser
R2(config)#interface serial 0/0/0
R2(config-if)#ip ad
R2(config-if)#ip address 192.1.12.2 255.255.255.0
R2(config-if)#no shu
```

```
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
exi
R2(config)#inter
R2(config)#interface gi
R2(config)#interface gigabitEthernet 0/0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

```
R2(config-if)#ip ad
R2(config-if)#ip address 192.1.23.2 255.255.255.0
```

Configuración inicial router 3

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

```
Router(config)#hostname R3
R3(config)#inter
R3(config)#interface lo1
R3(config)#interface loop
R3(config)#interface loopback 0
```

```
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

```
R3(config-if)#ip ad
R3(config-if)#ip address 3.3.3.3 255.0.0.0
R3(config-if)#exi
R3(config)#inter
R3(config)#interface lo
```

```
R3(config)#interface loopback 1
```

```
R3(config-if)#
```

```
%LINK-5-CHANGED: Interface Loopback1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up
```

```
R3(config-if)#ip ad
```

```
R3(config-if)#ip address 13.1.0.1 255.255.0.0
```

```
R3(config-if)#exit
```

```
R3(config)#inter
```

```
R3(config)#interface gi
```

```
R3(config)#interface gigabitEthernet 0/0
```

```
R3(config-if)#192.1.23.3 255.255.255.0
```

```
^
```

```
% Invalid input detected at '^' marker.
```

```
R3(config-if)#ip address 192.1.23.3 255.255.255.0
```

```
R3(config-if)#no shu
```

```
R3(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
```

```
R3(config-if)#inter
```

```
R3(config-if)#exi
```

```
R3(config)#inter
```

```
R3(config)#interface s
```

```
R3(config)#interface serial 0/0/0
```

```
R3(config-if)#ip ad
```

```
R3(config-if)#ip address 192.1.34.3 255.255.255.0
```

```
R3(config-if)#no shu
```

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

```
R3(config-if)#
```

```
R3(config-if)#exit
```

```
R3(config)# end
```

Configuración inicial router 4

```
Router#configure terminal
```

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

```
Router(config)#hostname R4
```



```
R4(config)#  
R4(config)#inter  
R4(config)#interface lo  
R4(config)#interface loopback 0
```

```
R4(config-if)#  
%LINK-5-CHANGED: Interface Loopback0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state  
to up
```

```
ip ad  
R4(config-if)#ip address 4.4.4.4 255.0.0.0  
R4(config-if)#exit  
R4(config)#inter  
R4(config)#interface lo  
R4(config)#interface loopback 1
```

```
R4(config-if)#  
%LINK-5-CHANGED: Interface Loopback1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state  
to up
```

```
R4(config-if)#ip ad  
R4(config-if)#ip address 14.1.0.1 255.255.0.0  
R4(config-if)#exit  
R4(config)#inter  
R4(config)#interface s  
R4(config)#interface serial 0/0/0  
R4(config-if)#ip ad  
R4(config-if)#ip address 192.1.34.4 255.255.255.0  
R4(config-if)#cloc  
R4(config-if)#clock ra  
R4(config-if)#clock rate 64  
R4(config-if)#clock rate 64000
```

1. Configure una relación de vecino BGP entre R1 y R2. R1 debe estar en **AS1** y R2 debe estar en **AS2**. Anuncie las direcciones de Loopback en BGP. Codifique los ID para los routers BGP como 11.11.11.11 para R1 y como 22.22.22.22 para R2. Presente el paso a con los comandos utilizados y la salida del comando **show ip route**.

```
R1(config)#router bgp 1
R1(config-router)#bgp router-id 11.11.11.11
R1(config-router)#neighbor 192.1.12.2 remote-as 2
R1(config-router)#network 1.0.0.0 mask 255.0.0.0
R1(config-router)#network 11.1.0.0 mask 255.255.0.0
R1(config-router)#exi
R1(config)#exi
```

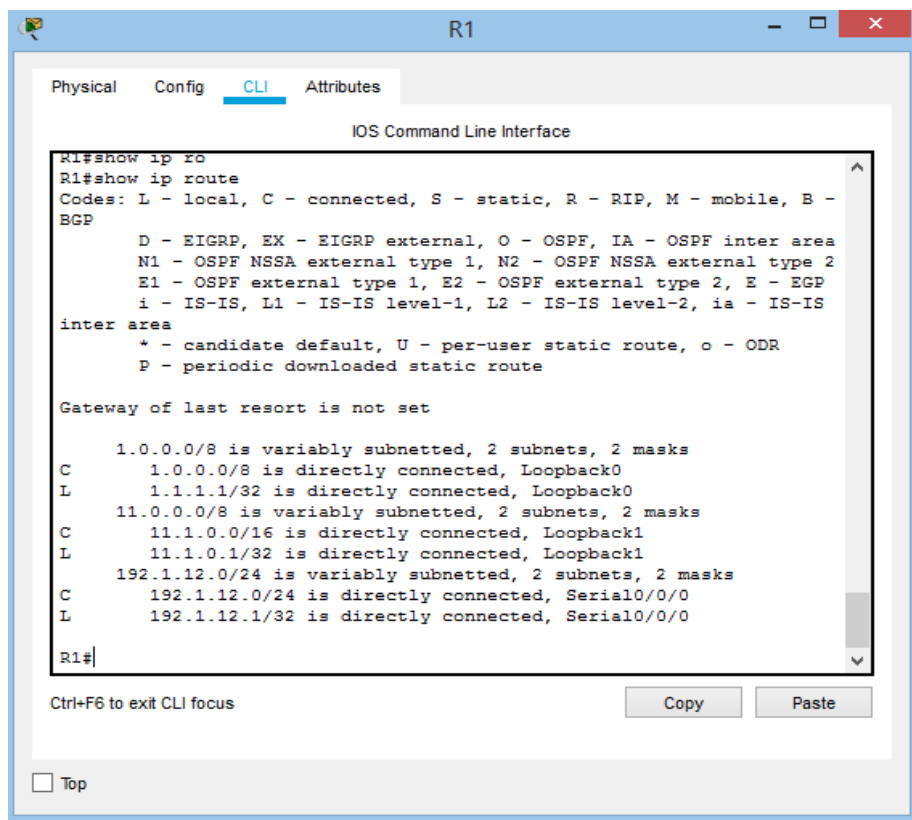


Figura 6. Relación de vecino BGP entre R1 y R2

```
R2#
R2#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router bgp 2
```

```

R2(config-router)#bgp router-id 22.22.22.22
R2(config-router)#neighbor 192.1.12.1 remote-as 1
R2(config-router)#network 2.0.0.0 mask 255.0.0.0
R2(config-router)#network 12.1.0.0 mask 255.255.0.0%BGP-5-ADJCHANGE:
neighbor 192.1.12.1 Up

```

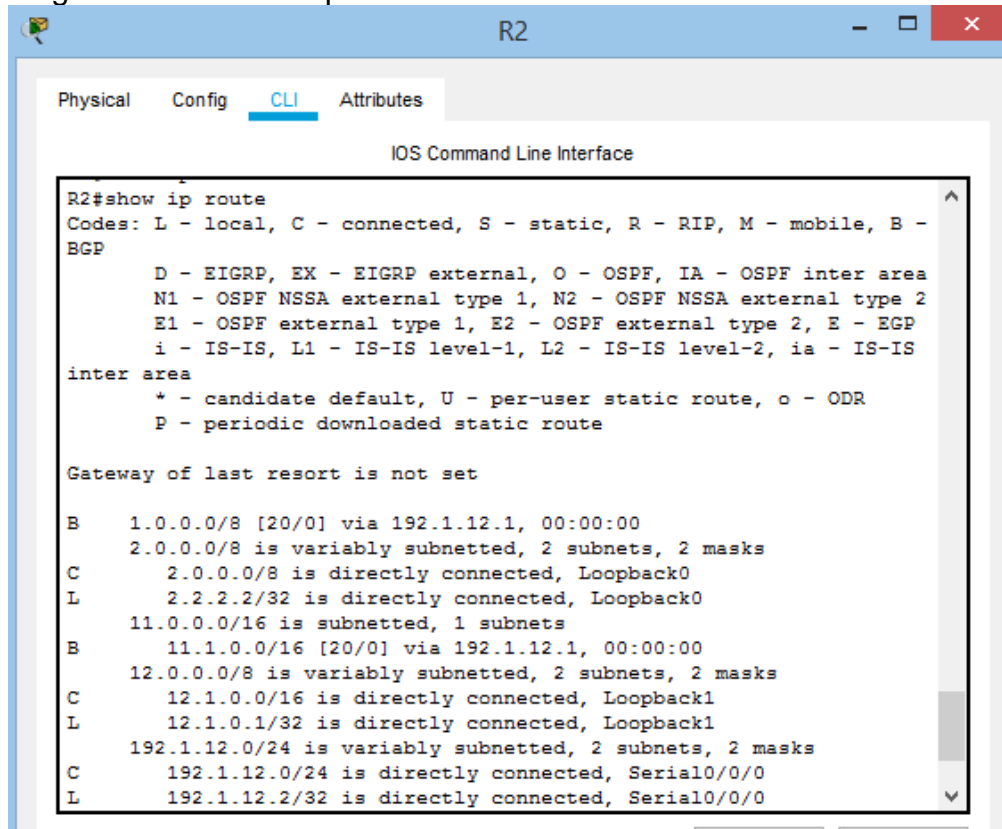


Figura 7. Relación de vecino BGP entre R1 y R2

2. Configure una relación de vecino BGP entre R2 y R3. R2 ya debería estar configurado en **AS2** y R3 debería estar en **AS3**. Anuncie las direcciones de Loopback de R3 en BGP. Codifique el ID del router R3 como 33.33.33.33. Presente el paso a con los comandos utilizados y la salida del comando **show ip route**.

```

R2(config)#
R2(config)#router bgp 2
R2(config-router)#neighbor 192.1.23.3 remote-as 3
R2(config-router)#exi

```

The screenshot shows the CLI of router R2. At the top, there are tabs for 'Physical', 'Config', 'CLI' (selected), and 'Attributes'. Below the tabs is the title 'IOS Command Line Interface'. The main content area displays the following text:

```

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

B 1.0.0.0/8 [20/0] via 192.1.12.1, 00:00:00
  2.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 2.0.0.0/8 is directly connected, Loopback0
L 2.2.2.2/32 is directly connected, Loopback0
B 3.0.0.0/8 [20/0] via 192.1.23.3, 00:00:00
  11.0.0.0/16 is subnetted, 1 subnets
B 11.1.0.0/16 [20/0] via 192.1.12.1, 00:00:00
  12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 12.1.0.0/16 is directly connected, Loopback1
L 12.1.0.1/32 is directly connected, Loopback1
  13.0.0.0/16 is subnetted, 1 subnets
B 13.1.0.0/16 [20/0] via 192.1.23.3, 00:00:00
--More--

```

Figura 8. Relación de vecino BGP entre R2 y R3

```

R3(config)#
R3(config)#router bgp 3
R3(config-router)#bgp router-id 33.33.33.33
R3(config-router)#neighbor 192.1.23.2 remote-as 2
R3(config-router)#network 3.0.0.0 mask 255.0.0.0
R3(config-router)#network 13.1.0.0 mask 255.255.0.0 %BGP-5-ADJCHANGE:
neighbor 192.1.23.2 Up

R3(config-router)#exi
R3(config)#exi

```

```

R3
Physical Config CLI Attributes
IOS Command Line Interface

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

Gateway of last resort is not set

B    1.0.0.0/8 [20/0] via 192.1.23.2, 00:00:00
B    2.0.0.0/8 [20/0] via 192.1.23.2, 00:00:00
    3.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    3.0.0.0/8 is directly connected, Loopback0
L    3.3.3.3/32 is directly connected, Loopback0
    11.0.0.0/16 is subnetted, 1 subnets
B    11.1.0.0/16 [20/0] via 192.1.23.2, 00:00:00
    12.0.0.0/16 is subnetted, 1 subnets
B    12.1.0.0/16 [20/0] via 192.1.23.2, 00:00:00
    13.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    13.1.0.0/16 is directly connected, Loopback1
L    13.1.0.1/32 is directly connected, Loopback1
    192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.1.23.0/24 is directly connected, GigabitEthernet0/0
L    192.1.23.3/32 is directly connected, GigabitEthernet0/0
    192.1.34.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.1.34.0/24 is directly connected, Serial0/0/0
L    192.1.34.3/32 is directly connected, Serial0/0/0

```

Figura 9. Relación de vecino BGP entre R2 y R3

- Configure una relación de vecino BGP entre R3 y R4. R3 ya debería estar configurado en **AS3** y R4 debería estar en **AS4**. Anuncie las direcciones de Loopback de R4 en BGP. Codifique el ID del router R4 como 44.44.44.44. Establezca las relaciones de vecino con base en las direcciones de Loopback 0. Cree rutas estáticas para alcanzar la Loopback 0 del otro router. No anuncie la Loopback 0 en BGP. Anuncie la red Loopback de R4 en BGP. Presente el paso a con los comandos utilizados y la salida del comando **show ip route**.

```

R4#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router b
R4(config)#router bgp 4
R4(config-router)#bgp router-id 44.44.44.44
R4(config-router)#neighbor 192.1.34.3 remote-as 3
R4(config-router)#network 4.0.0.0 mask 255.0.0.0
R4(config-router)#exit
R4(config)#ip route 3.0.0.0 255.0.0.0 192.1.34.3
R4(config)#router bgp 4
R4(config-router)#

```

```
R4(config-router)#no network 4.0.0.0 mask 255.0.0.0
R4(config-router)#network 4.0.0.0 mask 255.0.0.0
R4(config-router)#network 14.1.0.0 mask 255.255.0.0
R4(config-router)#
R4(config-router)#exit
R4(config)#exit
```

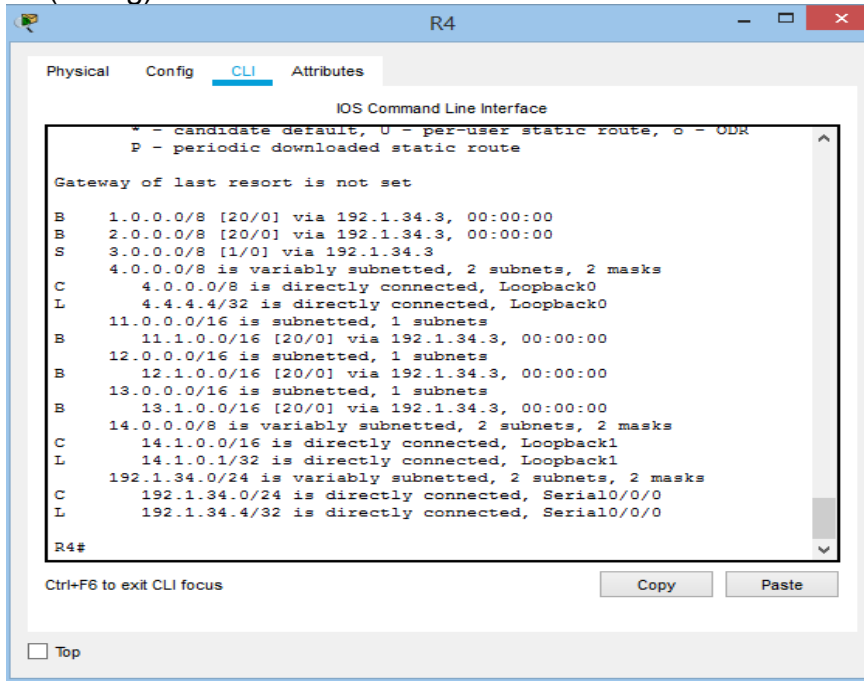


Figura 10. Red Loopback de R4 en BGP.

Escenario 3

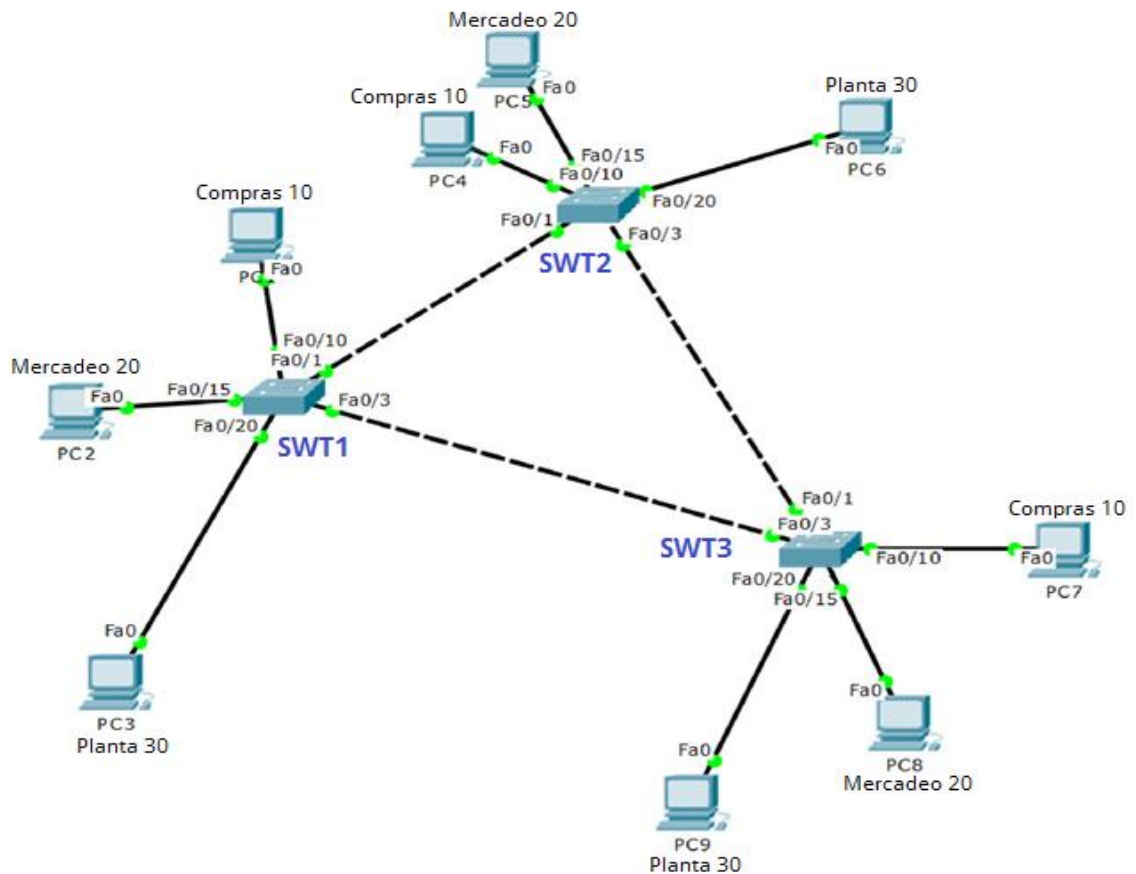


Figura 11. Escenario 3

A. Configurar VTP

1. Todos los switches se configurarán para usar VTP para las actualizaciones de VLAN. El switch SWT2 se configurará como el servidor. Los switches SWT1 y SWT3 se configurarán como clientes. Los switches estarán en el dominio VTP llamado CCNP y usando la contraseña cisco.

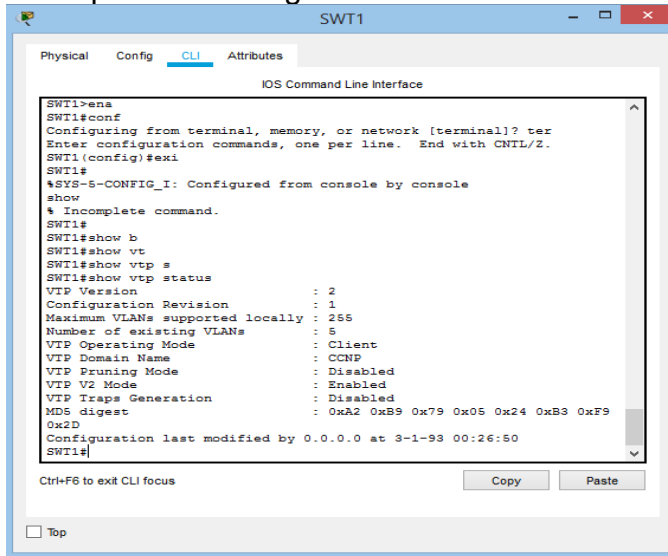
```
Switch>enable
Switch#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
Switch(config)#vtp version 2
```

```
Switch(config)#vtp mode client
Setting device to VTP CLIENT mode.
Switch(config)#vtp password cisco
Setting device VLAN database password to cisco
Switch(config)#
Switch(config)#hostname SWT1
SWT1(config)#
```

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SWT2
SWT2(config)#
SWT2(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
SWT2(config)#vtp version 2
SWT2(config)#vtp mode server
Device mode already VTP SERVER.
SWT2(config)#vtp password cisco
Setting device VLAN
```

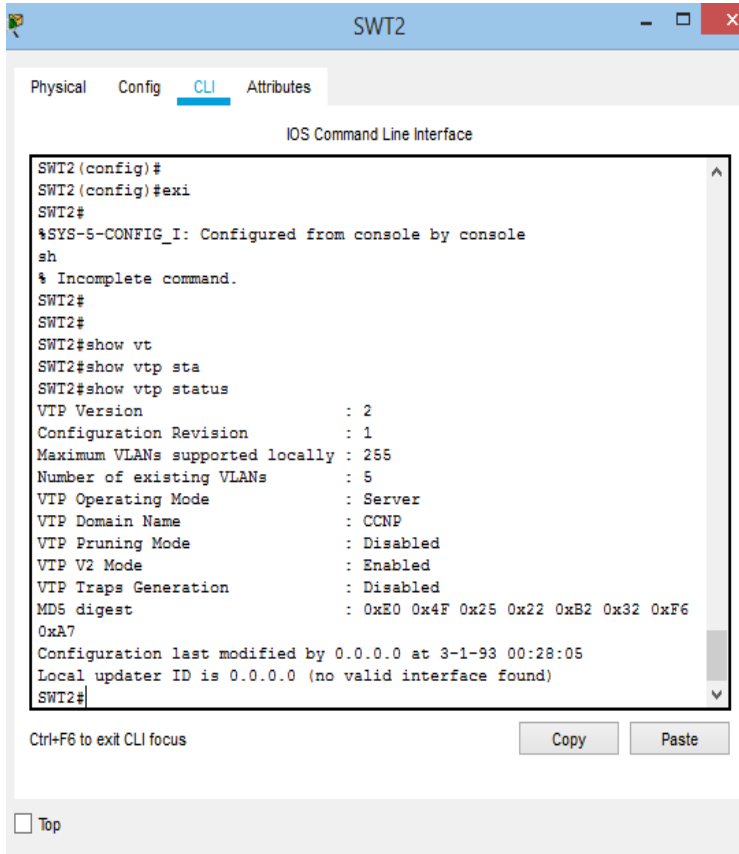
```
Switch>ena
Switch#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vtp domain CCNP
Changing VTP domain name from NULL to CCNP
Switch(config)#vtp version 2
Switch(config)#vtp mode client
Setting device to VTP CLIENT mode.
Switch(config)#vtp password cisco
Setting device VLAN database password to cisco
Switch(config)#
Switch(config)#hostname SWT3
```


2. Verifique las configuraciones mediante el comando **show vtp status**.



```
SWT1>ena
SWT1#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT1(config)#exi
SWT1#
%SYS-5-CONFIG_I: Configured from console by console
show
% Incomplete command.
SWT1#
SWT1#show b
SWT1#show vt
SWT1#show vtp s
SWT1#show vtp status
VTP Version                : 2
Configuration Revision     : 1
Maximum VLANs supported locally : 255
Number of existing VLANs   : 5
VTP Operating Mode         : Client
VTP Domain Name            : CCNP
VTP Pruning Mode           : Disabled
VTP V2 Mode                : Enabled
VTP Traps Generation       : Disabled
MD5 digest                  : 0xA2 0xB9 0x79 0x05 0x24 0xB3 0xF9
0x2D
Configuration last modified by 0.0.0.0 at 3-1-93 00:26:50
SWT1#
```

Figura 12. VTP Estatus escenario 3 SW1



```
SWT2
Physical Config CLI Attributes
IOS Command Line Interface
SWT2(config)#
SWT2(config)#exi
SWT2#
%SYS-5-CONFIG_I: Configured from console by console
sh
% Incomplete command.
SWT2#
SWT2#
SWT2#show vt
SWT2#show vtp sta
SWT2#show vtp status
VTP Version                : 2
Configuration Revision     : 1
Maximum VLANs supported locally : 255
Number of existing VLANs   : 5
VTP Operating Mode         : Server
VTP Domain Name            : CCNP
VTP Pruning Mode           : Disabled
VTP V2 Mode                : Enabled
VTP Traps Generation       : Disabled
MD5 digest                  : 0xE0 0x4F 0x25 0x22 0xB2 0x32 0xF6
0xA7
Configuration last modified by 0.0.0.0 at 3-1-93 00:28:05
Local updater ID is 0.0.0.0 (no valid interface found)
SWT2#
```

Figura 13. VTP Estatus escenario 3 SW2

```

SWT3
-----
Physical  Config  CLI  Attributes
-----
IOS Command Line Interface

SWT3(config)#
SWT3(config)#interface FastEthernet0/9
SWT3(config-if)#exi
SWT3(config)#exi
SWT3#
%SYS-5-CONFIG_I: Configured from console by console

SWT3#
SWT3#
SWT3#show vtp
SWT3#show vtp sta
SWT3#show vtp status
VTP Version          : 2
Configuration Revision : 1
Maximum VLANs supported locally : 255
Number of existing VLANs : 5
VTP Operating Mode    : Client
VTP Domain Name       : CCNP
VTP Pruning Mode      : Disabled
VTP V2 Mode           : Enabled
VTP Traps Generation  : Disabled
MDS digest            : 0x61 0xAF 0xFC 0xE9 0x32 0x93 0x6C
0x19
Configuration last modified by 0.0.0.0 at 3-1-93 00:29:24
SWT3#

```

Figura 14. VTP Estatus escenario 3 SWT3

B. Configurar DTP (Dynamic Trunking Protocol)

1. Configure un enlace troncal ("trunk") dinámico entre SWT1 y SWT2. Debido a que el modo por defecto es **dynamic auto**, solo un lado del enlace debe configurarse como **dynamic desirable**.

```

SWT1#conf
SWT1#configure
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT1(config)#interface fastEthernet 0/1
SWT1(config-if)#switchport mode dynamic desirable

```

```

SWT1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up

```

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to down

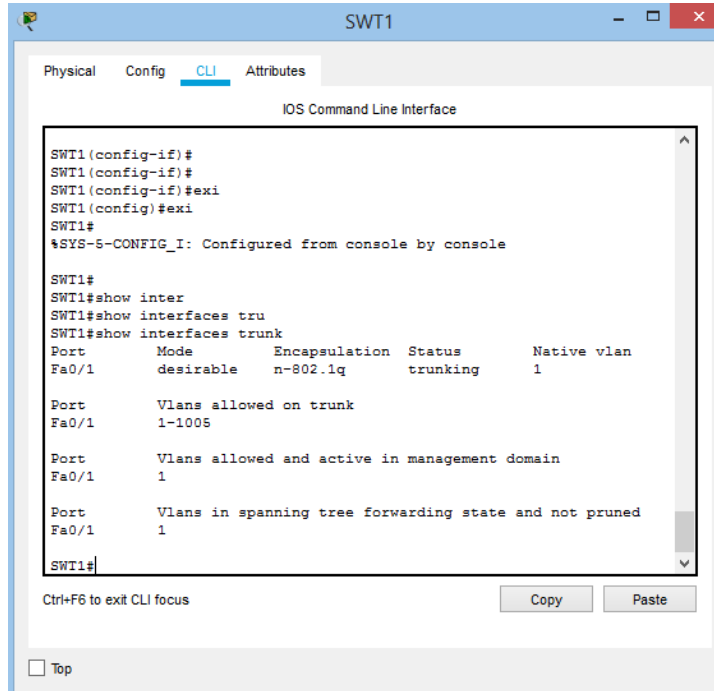
```

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up

```

2. Verifique el enlace "trunk" entre SWT1 y SWT2 usando el comando **show interfaces trunk**.



```
SWT1#show inter
SWT1#show interfaces tru
SWT1#show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/1     desirable n-802.1q       trunking    1

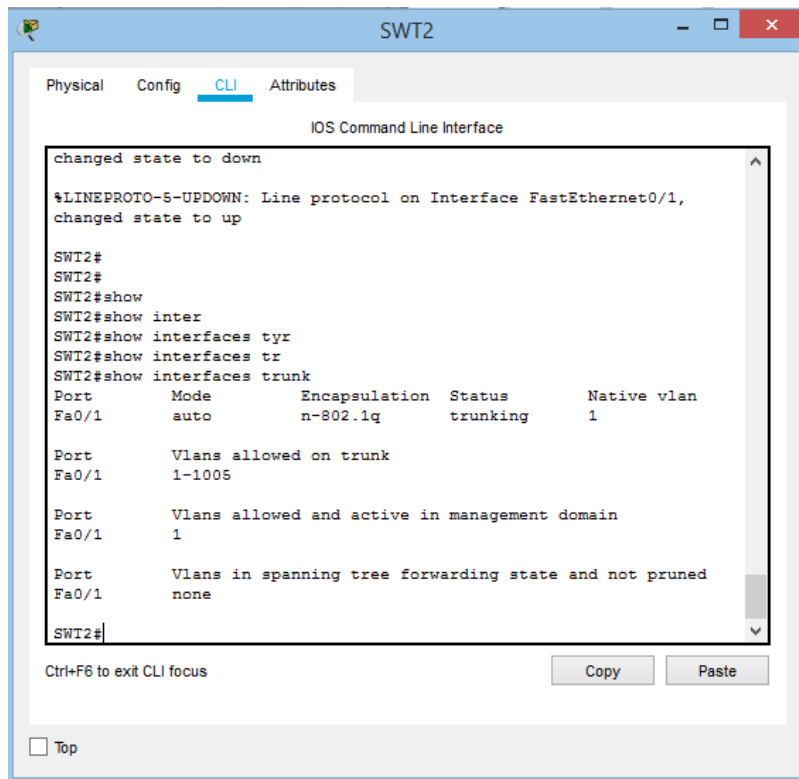
Port      Vlans allowed on trunk
Fa0/1     1-1005

Port      Vlans allowed and active in management domain
Fa0/1     1

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/1     1

SWT1#
```

Figura 15. Enlace TRUNK SWT1



```
changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

SWT2#
SWT2#
SWT2#show
SWT2#show inter
SWT2#show interfaces tyr
SWT2#show interfaces tr
SWT2#show interfaces trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/1     auto      n-802.1q       trunking    1

Port      Vlans allowed on trunk
Fa0/1     1-1005

Port      Vlans allowed and active in management domain
Fa0/1     1

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/1     none

SWT2#
```

Figura 16. Enlace TRUNK SWT2

- Entre SWT1 y SWT3 configure un enlace "trunk" estático utilizando el comando switchport **mode trunk** en la interfaz F0/3 de SWT1

```
SWT1>enable
```

```
SWT1#configure terminal Enter configuration commands, one per line. End with CNTL/Z.
```

```
SWT1(config)#interface fastEthernet 0/3
```

```
SWT1(config-if)#switchport mode trunk
```

```
SWT1(config-if)#
```

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

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

- Verifique el enlace "trunk" el comando **show interfaces trunk** en SWT1

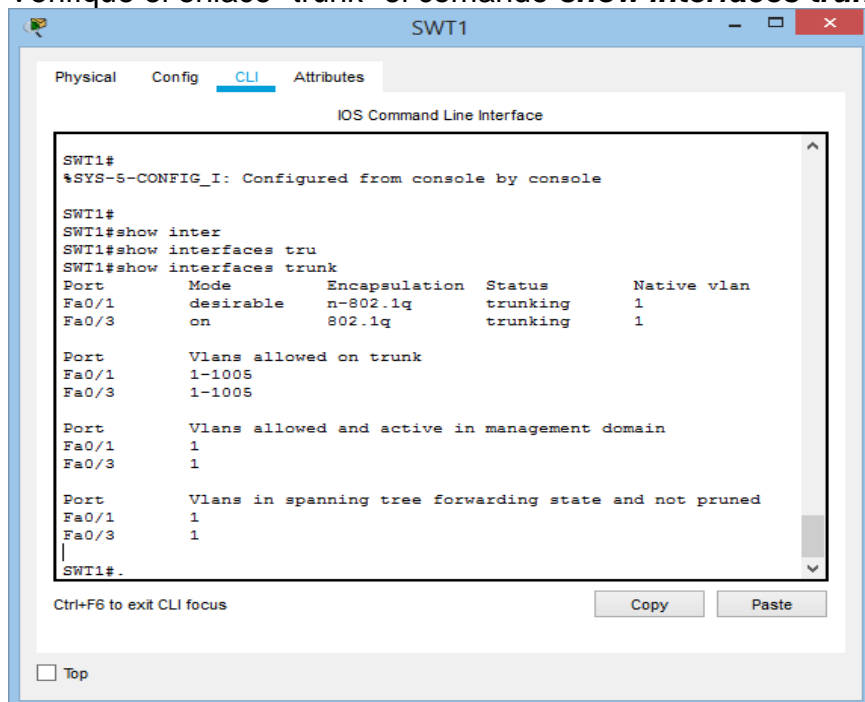


Figura 17. Enlace TRUNK estático SWT1

- Configure un enlace "trunk" permanente entre SWT2 y SWT3

```
SWT2#
```

```
SWT2#conf
```

```
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
```

```
SWT2(config)#interface fastEthernet 0/3
SWT2(config-if)#switchport mode trunk
```

```
SWT2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed
state to up
SWT2(config)#exi
SWT2#
```

```
SWT3#
SWT3#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up
s
SWT3(config)#interface fastEthernet 0/1
SWT3(config-if)#switchport mode trunk
SWT3(config-if)#exit
SWT3(config)#exit
SWT3#
```

C. Agregar VLANs y asignar puertos.

1. En STW1 agregue la VLAN 10. En STW2 agregue las VLANs Compras (10), Mercadeo (20), Planta (30) y Admon (99)

```
SWT1#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT1(config)#vlan 10
VTP VLAN configuration not allowed when device is in CLIENT mode.
SWT1(config)#
```

```
SWT2#
SWT2#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT2(config)#vlan 10
```

```

SWT2(config-vlan)#name Compras
SWT2(config-vlan)#vlan 20
SWT2(config-vlan)#name Mercadeo
SWT2(config-vlan)#vlan 30
SWT2(config-vlan)#name Planta
SWT2(config-vlan)#vlan 99
SWT2(config-vlan)#name Admon
SWT2(config-vlan)#exit
SWT2(config)#

```

2. Verifique que las VLANs han sido agregadas correctamente

```
SWT1(config)#vlan 10
```

VTP VLAN configuration not allowed when device is in CLIENT mode

SWT1: En este Swith no se pude crear la vlan 10 ya que tiene un vtp en modo cliente, lo que no deja crear la vlan de acuerdo al error indicado

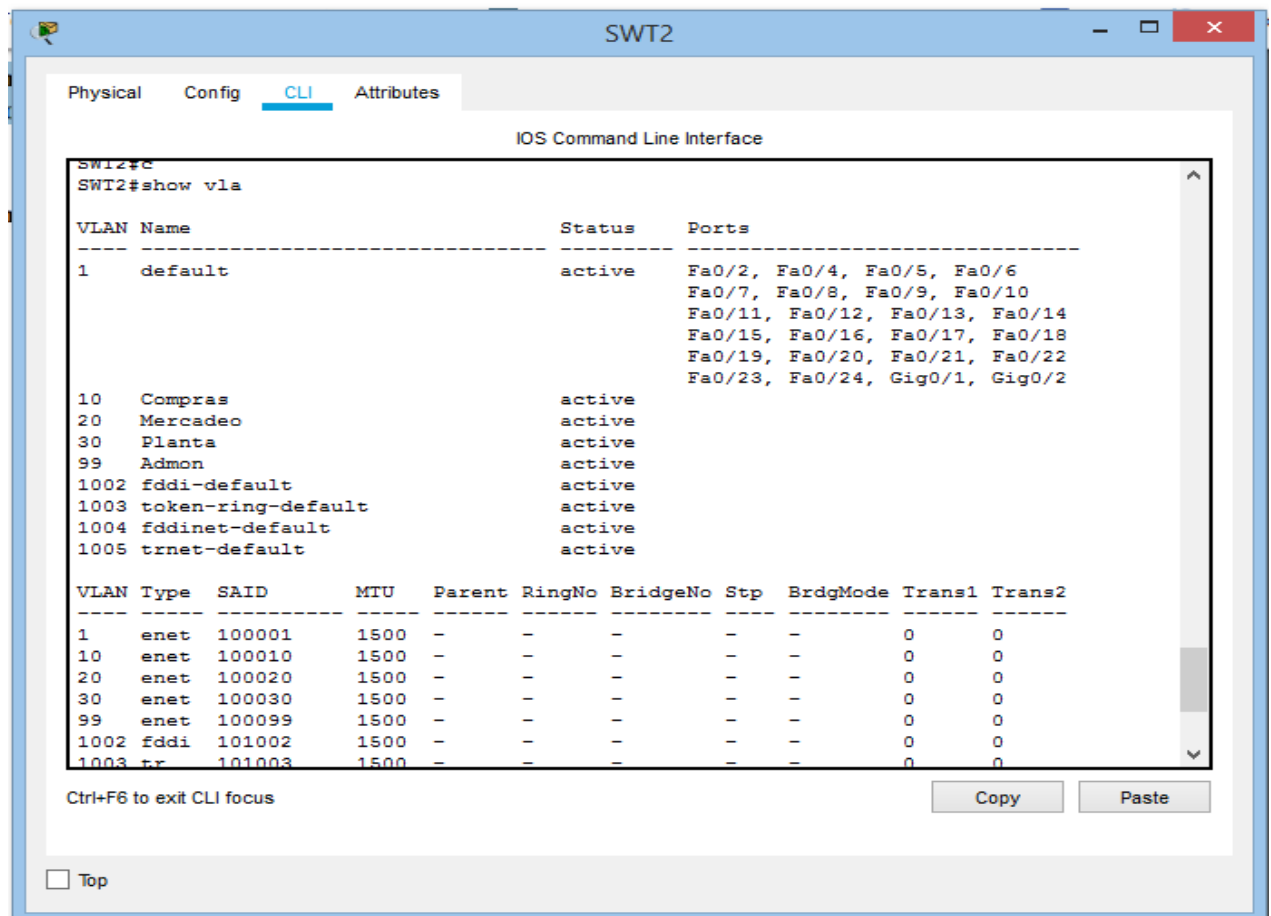


Figura 18. VLAN 10 Y VTP en modo cliente SWT2

1. Asocie los puertos a las VLAN y configure las direcciones IP de acuerdo con la siguiente tabla.

Tabla 4. Interfaces / VLAN Escenario 3.

Interfaz	VLAN	Direcciones IP de los PCs
F0/10	VLAN 10	190.108.10.X / 24
F0/15	VLAN 20	190.108.20.X / 24
F0/20	VLAN 30	190.108.30.X / 24

X = número de cada PC particular

SWT1>

SWT1>enable

SWT1#configure terminal

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

SWT1(config)#interface vlan 10

SWT1(config-if)#

%LINK-5-CHANGED: Interface Vlan10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state to up

SWT1(config-if)#ip address 190.108.10.1 255.255.255.0

SWT1(config-if)#exit

SWT1(config)#interface vlan 20

%LINK-5-CHANGED: Interface Vlan20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to up

SWT1(config-if)#ip address 190.108.20.1 255.255.255.0

SWT1(config-if)#exit

SWT1(config)#interface vlan 30

SWT1(config-if)#

%LINK-5-CHANGED: Interface Vlan30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

SWT1(config-if)#ip address 190.108.30.1 255.255.255.0

SWT1(config-if)#exit

SWT1(config)#

SWT2#

SWT2(config)#

SWT2(config)#interface vlan 10

%LINK-5-CHANGED: Interface Vlan10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state to up

SWT2(config-if)#ip address 190.108.10.2 255.255.255.0

SWT2(config-if)#exit

SWT2(config)#interface vlan 20

%LINK-5-CHANGED: Interface Vlan20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to up

SWT2(config-if)#ip address 190.108.20.2 255.255.255.0

SWT2(config-if)#exit

SWT2(config)#interface vlan 30

%LINK-5-CHANGED: Interface Vlan30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

SWT2(config-if)#ip address 190.108.30.2 255.255.255.0

SWT2(config-if)#exit

SWT2(config)#

SWT3>

SWT3#conf

SWT3(config)#interface vlan 10

%LINK-5-CHANGED: Interface Vlan10, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan10, changed state to up

SWT3(config-if)#ip address 190.108.10.3 255.255.255.0

SWT3(config-if)#exit

SWT3(config)#interface vlan 20

%LINK-5-CHANGED: Interface Vlan20, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan20, changed state to up

SWT3(config-if)#ip address 190.108.20.3 255.255.255.0

SWT3(config-if)#exit

SWT3(config)#interface vlan 30

%LINK-5-CHANGED: Interface Vlan30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

2. Configure el puerto F0/10 en modo de acceso para SWT1, SWT2 y SWT3 y asígnelo a la VLAN 10.

```
SWT1(config)#interface fastEthernet 0/10
SWT1(config-if)#switchport mode access
SWT1(config-if)#switchport access vlan 10
SWT1(config-if)#exit
SWT1(config)#exit
SWT1#
```

```
SWT2(config)#interface fastEthernet 0/10
SWT2(config-if)#switchport mode access
SWT2(config-if)#switchport access vlan 10
SWT2(config-if)#exit
SWT2(config)#exit
```

```
SWT3(config)#interface fastEthernet 0/10
SWT3(config-if)#switchport mode access
SWT3(config-if)#switchport access vlan 10
SWT3(config-if)#exit
SWT3(config)#exit
SWT3#
```

3. Repita el procedimiento para los puertos F0/15 y F0/20 en SWT1, SWT2 y SWT3. Asigne las VLANs y las direcciones IP de los PCs de acuerdo con la tabla de arriba.

SWT1#

```
SWT1#configure ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT1(config)#interface fastEthernet 0/15
SWT1(config-if)#switchport mode access
SWT1(config-if)#switchport access vlan 20
SWT1(config-if)#exit
SWT1(config)#interface fastEthernet 0/20
SWT1(config-if)#switchport mode access
SWT1(config-if)#switchport access vlan 30
SWT1(config-if)#exit
```

```
SWT1(config)#exit
SWT1#
%SYS-5-CONFIG_I: Configured from console by console
```

```
SWT2#
SWT2#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT2(config)#interface fastEthernet 0/15
SWT2(config-if)#switchport mode access
SWT2(config-if)#switchport access vlan 20
SWT2(config-if)#exit
SWT2(config)#interface fastEthernet 0/20
SWT2(config-if)#switchport mode access
SWT2(config-if)#switchport access vlan 30
SWT2(config-if)#exi
SWT2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
SWT3#
SWT3#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.
SWT3(config)#interface fastEthernet 0/15
SWT3(config-if)#switchport mode access
SWT3(config-if)#switchport access vlan 20
SWT3(config-if)#exit
SWT3(config)#interface fastEthernet 0/20
SWT3(config-if)#switchport mode access
SWT3(config-if)#switchport access vlan 30
SWT3(config-if)#exit
```

D. Configurar las direcciones IP en los Switches.

1. En cada uno de los Switches asigne una dirección IP al SVI (*Switch Virtual Interface*) para VLAN 99 de acuerdo con la siguiente tabla de direccionamiento y active la interfaz.

Tabla 5. SVI Switchs Escenario 3

Equipo	Interfaz	Dirección IP	Máscara
SWT1	VLAN 99	190.108.99.1	255.255.255.0
SWT2	VLAN 99	190.108.99.2	255.255.255.0
SWT3	VLAN 99	190.108.99.3	255.255.255.0

SWT1#

SWT1#conf

Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.

SWT1(config)#interface vlan 99

%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

SWT1(config-if)#ip address 190.108.99.1 255.255.255.0

SWT1(config-if)#exit

SWT1(config)#

SWT2#

SWT2#conf

Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.

SWT2(config)#interface vlan 99

%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

SWT2(config-if)#ip address 190.108.99.2 255.255.255.0

SWT2(config-if)#exit

SWT2(config)#

SWT3#

SWT3#config

Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line. End with CNTL/Z.

SWT3(config)#interface vlan 99

%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed state to up

SWT3(config-if)#ip address 190.108.99.3 255.255.255.0

SWT3(config-if)#end

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

E. Verificar la conectividad Extremo a Extremo

1. Ejecute un Ping desde cada PC a los demás. Explique por qué el ping tuvo o no tuvo éxito.

Cuando el ping es realizado para equipos que estén incluidos dentro de la misma VLAN funciona sin embargo primero debe ser configurado el direccionamiento en las maquinas para realizar las pruebas de ping

2. Ejecute un Ping desde cada Switch a los demás. Explique por qué el ping tuvo o no tuvo éxito.

Para que el ping es necesario realizarlo a las direcciones ip que están incluidas y asociadas a la ip de la VLAN 99 la cual es la que permite esta conectividad entre los Swith

3. Ejecute un Ping desde cada Switch a cada PC. Explique por qué el ping tuvo o no tuvo éxito.

Al establecer los Switch en trunk con acces permite realizar el ping a las diferentes maquinas teniendo en cuenta que a estas se las configuro el direccionamiento adecuado

Conclusiones

Con el desarrollo de la presente actividad logramos reconocer los fundamentos aplicados a la configuración de un dispositivo dentro de una red de datos, y siendo de esta forma fundamental para su correcto funcionamiento y disponibilidad de la red. Siendo de esta forma aplicamos todos los conceptos aprendidos dentro del diplomado de profundización Cisco CCNP donde entramos a reconocer la redistribución de rutas por ejemplo que nos proporcionan protocolos como EIGRP Y OSPF.

Configurar una interfaz de loopback para asociar esta interfaz en procesos OSPF y BGP, aseguramos que no vamos a perder las sesiones OSPF o BGP por un problema físico en la interfaz, ya que las interfaces de loopback son interfaces lógicas, siendo una técnica, aunque no muy común el aplicar estos protocolos a nuestros enrutadores nos brinda la redistribución como la queremos en nuestra red.

Ahora bien, también comprendimos la aplicabilidad de protocolos dentro de los switch siendo de esta forma que el aplicar por ejemplo redes VLAN y troncales en nuestra red es fundamental para su funcionamiento ya que esto nos proporciona una excelente seguridad en nuestra red y una reorganización que nos evita picos altos de datos y cuellos de botella en la red.

Los switches como logramos evidenciar permiten configurar VTP para las actualizaciones de VLAN, con lo cual logramos tener un switch de servidor y dos de clientes con el fin de lograr aplicar las actualizaciones, así mismo con el protocolo DTP el cual se habilita automáticamente en un puerto del switch cuando se configura un modo de trunking según el puerto seleccionado. Esto implica que si estamos configurando un switch Cisco para DTP, el puerto del otro lado del enlace también debe tener DTP UP para que el enlace este configurado correctamente.

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