SOLUCIÓN DE ESTUDIOS DE CASO BAJO EL USO DE TECNOLOGÍA CISCO.

POR:

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208014_10**.**

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DIPLOMADO DE PROFUNDIZACIÓN CCNP.

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TABLA DE CONTENIDO.

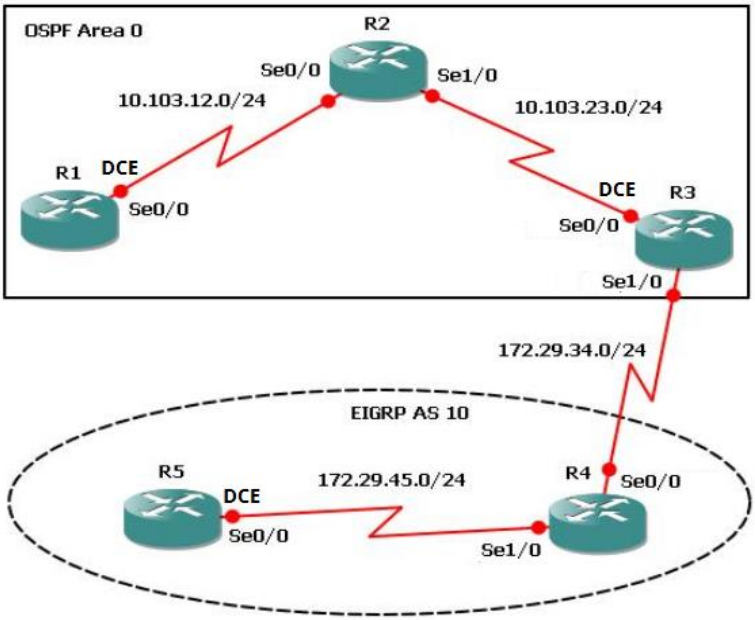
1. INTRODUCCIÓN.

Las redes actualmente están teniendo cambios radicales y los ingenieros del futuro deben estar preparados para la implementación y soporte de nuevas tecnologías como SDN en la WAN y la LAN. Estos desafíos deben ser resueltos a través del desarrollo y profundización de competencias, lo cual lo ofrece diplomado de profundización de Cisco CCNP; el curso de cisco CCNP, brinda una completa descripción de los conceptos de redes de nivel empresarial, cómo implementarlas y resolver sus problemas. Además se ofrece un estudio avanzado de tecnologías de enrutamiento y conmutación para redes empresariales de datos, voz y video convergentes.

El siguiente trabajo de profundización tiene como objetivo identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado. Lo esencial es poner a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

2. PRODUCTO DEL TRABAJO.

a. 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.**

Configuraciones sobre enrutador R1:

- Router>enable
- Router#configure terminal

  Router(config)#hostname R1

- R1(config)#interface serial 0/0/0

  R1(config-if)#description TO R2

  R1(config-if)#ip address 10.103.12.1 255.255.255.0

  R1(config-if)#no shutdown

- R1(config)#router ospf 1

  R1(config-router)#network 10.103.12.0 0.0.0.255 area 0

Configuraciones sobre enrutador R2:

- Router>enable
- Router#configure terminal

  Router(config)#hostname R2

- R2(config)#interface serial 0/0/0

  R2(config-if)#description TO R1

  R2(config-if)#ip address 10.103.12.2 255.255.255.0

  R2(config-if)#no shutdown

- R2(config)#interface serial 0/0/1

  R2(config-if)#description TO R3

  R2(config-if)#ip address 10.103.23.1 255.255.255.0

  R2(config-if)#no shutdown

- R2(config)#router ospf 1

  R2(config-router)#network 10.103.12.0 0.0.0.255 area 0

  R2(config-router)#network 10.103.23.0 0.0.0.255 area 0

Configuraciones sobre enrutador R3:

- Router>enable
- Router#configure terminal

  Router(config)#hostname R3
- R3(config)#interface serial 0/0/0

  R3(config-if)#description TO R2

  R3(config-if)#ip address 10.103.23.2 255.255.255.0

  R3(config-if)#no shutdown
- R3(config)#interface serial 0/0/1

  R3(config-if)#description TO R4

  R3(config-if)#ip address 172.29.34.1 255.255.255.0

  R3(config-if)#no shutdown
- R3(config)#router ospf 1

  R3(config-router)#network 10.103.23.0 0.0.0.255 area 0
- R3(config)#router eigrp 10

R3(config-router)#network 172.29.34.0 0.0.0.255

Configuraciones sobre enrutador R4:

- Router>enable
- Router#configure terminal

  Router(config)#hostname R4
- R4(config)#interface serial 0/0/0

  R4(config-if)#description TO R3

  R4(config-if)#ip address 172.29.34.2 255.255.255.0

  R4(config-if)#no shutdown
- R4(config)#interface serial 0/0/1

  R4(config-if)#description TO R5

  R4(config-if)#ip address 172.29.45.1 255.255.255.0

  R4(config-if)#no shutdown
- R4(config)#router eigrp 10

  R4(config-router)#network 172.29.34.0 0.0.0.255

  R4(config-router)#network 172.29.45.0 0.0.0.255

Configuraciones sobre enrutador R5:

- Router>enable
- Router#configure terminal

  Router(config)#hostname R5
- R5(config)#interface serial 0/0/0

  R5(config-if)#description TO R4

  R5(config-if)#ip address 172.29.45.2 255.255.255.0

  R5(config-if)#no shutdown
- R5(config)#router eigrp 10

  R5(config-router)#network 172.29.45.0 0.0.0.255

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.**

Configuraciones sobre enrutador R1:

- R1(config)#interface loopback1

  R1(config-if)#description NETWORK 1

  R1(config-if)#ip ospf network point-to-point

R1(config-if)#ip address 10.1.1.1 255.255.255.0

- R1(config)#interface loopback2

  R1(config-if)#description NETWORK 2

  R1(config-if)#ip ospf network point-to-point

  R1(config-if)#ip address 10.1.2.1 255.255.255.0

- R1(config)#interface loopback3

  R1(config-if)#description NETWORK 3

  R1(config-if)#ip ospf network point-to-point

  R1(config-if)#ip address 10.1.3.1 255.255.255.0

- R1(config)#interface loopback4

  R1(config-if)#description NETWORK 4

  R1(config-if)#ip ospf network point-to-point

  R1(config-if)#ip address 10.1.4.1 255.255.255.0

- R1(config)#router ospf 1

  R1(config-router)#network 10.1.1.1 0.0.0.255 area 0

  R1(config-router)#network 10.1.2.1 0.0.0.255 area 0

R1(config-router)#network 10.1.3.1 0.0.0.255 area 0

R1(config-router)#network 10.1.4.1 0.0.0.255 area 0

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.**

Configuraciones sobre enrutador R5:

- R5(config)#interface loopback1

  R5(config-if)#description NETWORK 1

  R5(config-if)#ip address 172.5.1.1 255.255.255.0

- R5(config)#interface loopback2

  R5(config-if)#description NETWORK 2

  R5(config-if)#ip address 172.5.2.1 255.255.255.0

- R5(config)#interface loopback3

  R5(config-if)#description NETWORK 3

  R5(config-if)#ip address 172.5.3.1 255.255.255.0

- R5(config)#interface loopback4

  R5(config-if)#description NETWORK 4

  R5(config-if)#ip address 172.5.4.1 255.255.255.0

- R5(config)#router eigrp 10

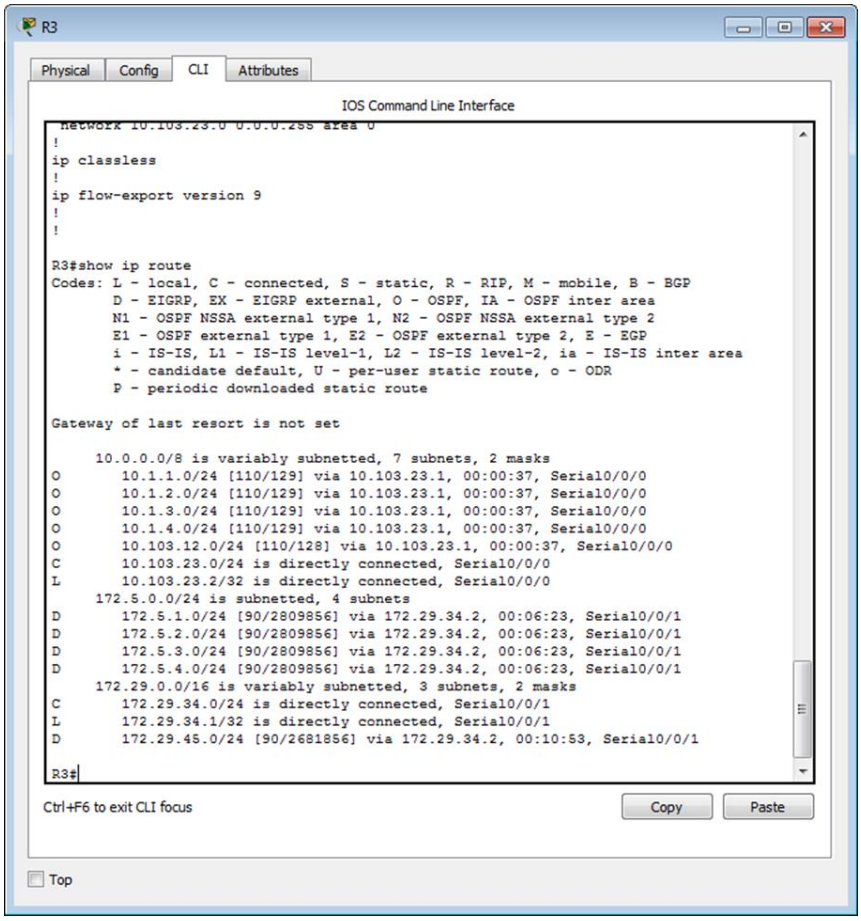
  R5(config-router)#network 172.5.1.0 0.0.0.255

  R5(config-router)#network 172.5.2.0 0.0.0.255

  R5(config-router)#network 172.5.3.0 0.0.0.255

  R5(config-router)#network 172.5.4.0 0.0.0.255

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



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.**

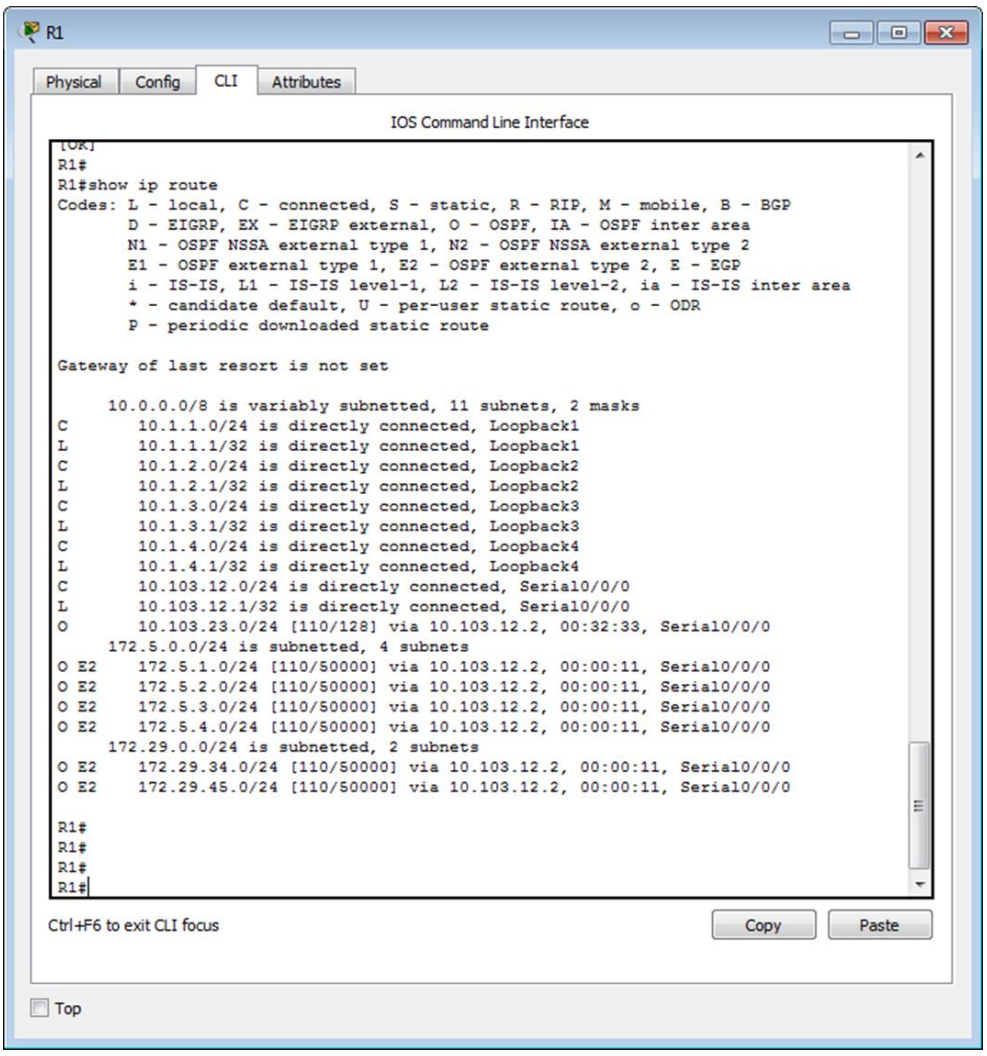
- R3(config)#router eigrp 10

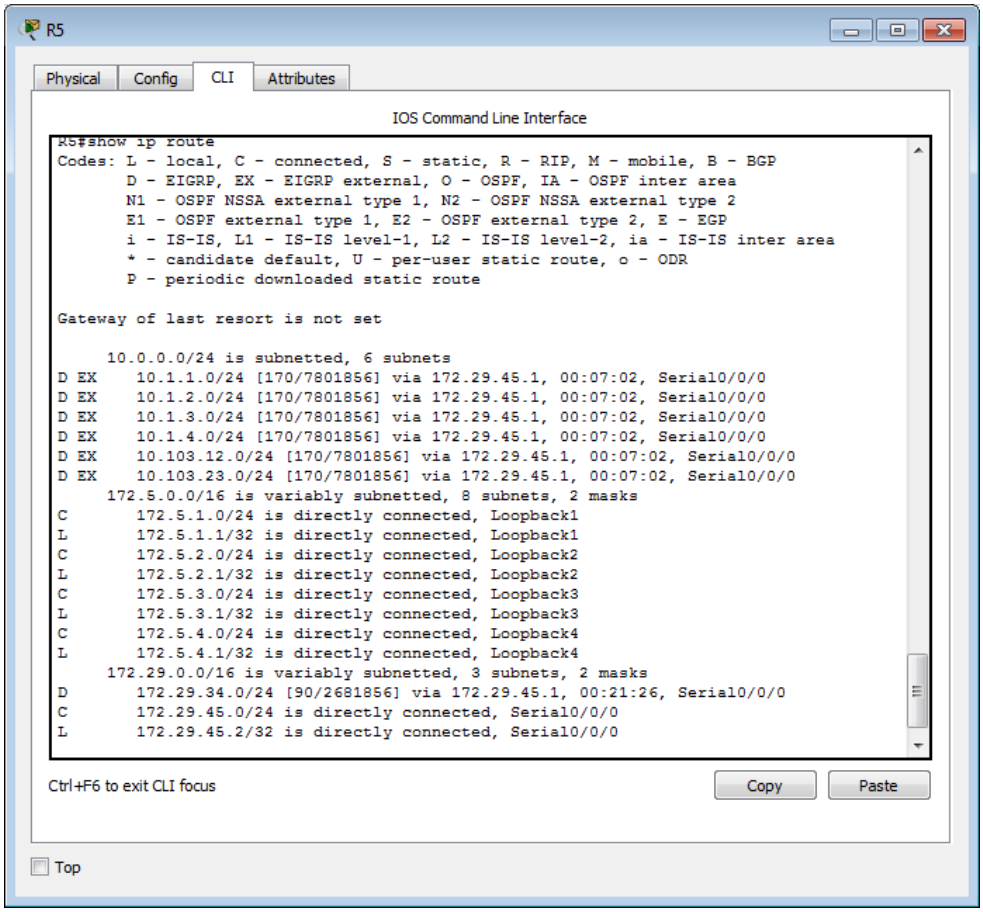
  redistribute ospf 1 metric 1544 20000 255 1 1500

- R3(config)#router ospf 1

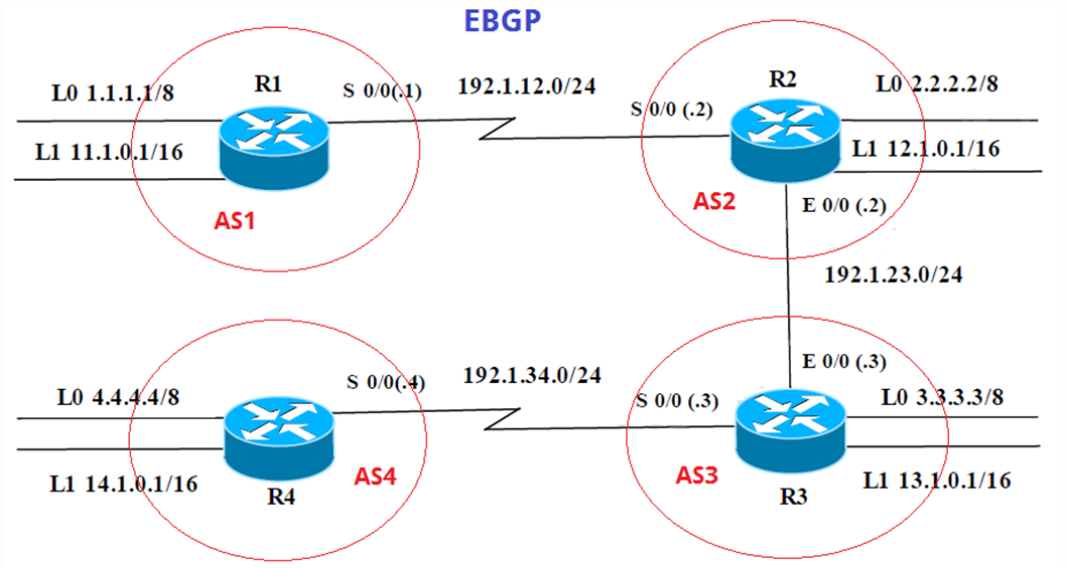
  redistribute eigrp 10 metric 50000 subnets

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.**





b. Escenario 2.



Información para configuración de los Routers.

R1

Interfaz	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

R2

Interfaz	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

R3

Interfaz	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

R4

Interfaz	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

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.**

Configuraciones sobre enrutador R1:

- Router>enable

- Router#configure terminal
- Router(config)#hostname R1
- R1(config)#interface serial 0/0/0

  R1(config-if)#description TO R2

  R1(config-if)#ip address 192.1.12.1 255.255.255.0

  R1(config-if)#no shutdown
- R1(config)#interface loopback0

  R1(config-if)#description NETWORK 0

  R1(config-if)#ip address 1.1.1.1 255.0.0.0
- R1(config)#interface loopback1

  R1(config-if)#description NETWORK 1

  R1(config-if)#ip address 11.1.0.1 255.255.0.0

- R1(config-if)#router bgp 65000

  R1(config-router)#neighbor 192.168.12.2 remote-as 65001

  R1(config-router)#bgp router-id 11.11.11.11

  R1(config-router)#network 1.1.1.1 mask 255.0.0.0

  R1(config-router)#network 11.1.0.1 mask 255.255.0.0

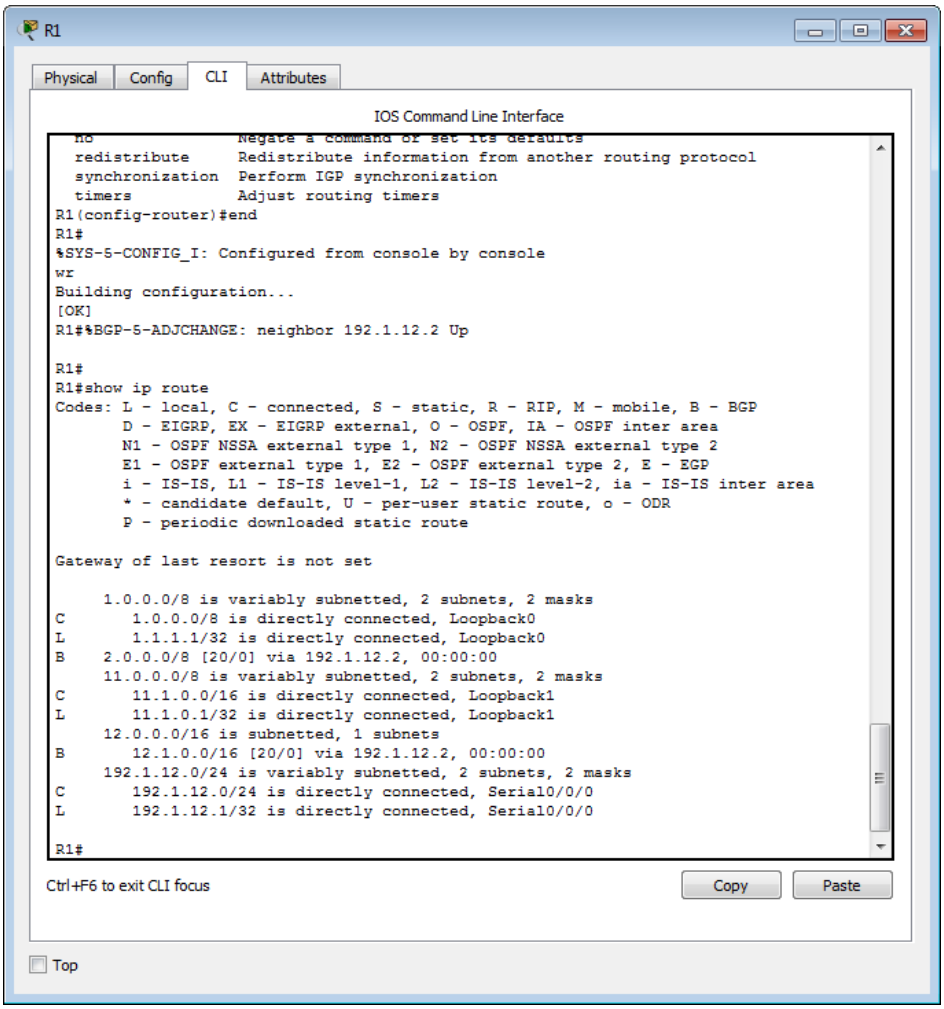
- R1(config-if)#router bgp 65000

R1(config-router)#neighbor 192.1.12.2 remote-as 65001

R1(config-router)#bgp router-id 11.11.11.11

R1(config-router)#network 1.1.1.1 mask 255.0.0.0

R1(config-router)#network 11.1.0.1 mask 255.255.0.0



Configuraciones sobre enrutador R2:

- Router>enable

- Router#configure terminal
- Router(config)#hostname R2
- R2(config)#interface serial 0/0/0

  R2(config-if)#description TO R1

  R2(config-if)#ip address 192.1.12.2 255.255.255.0

  R2(config-if)#no shutdown
- R2(config)#interface GigabitEthernet0/0

  R2(config-if)#description TO R3

  R2(config-if)#ip address 192.1.23.2 255.255.255.0

  R2(config-if)#no shutdown
- R2(config)#interface loopback0

  R2(config-if)#description NETWORK 0

  R2(config-if)#ip address 2.2.2.2 255.0.0.0
- R2(config-if)#interface loopback1

  R2(config-if)#description NETWORK 1

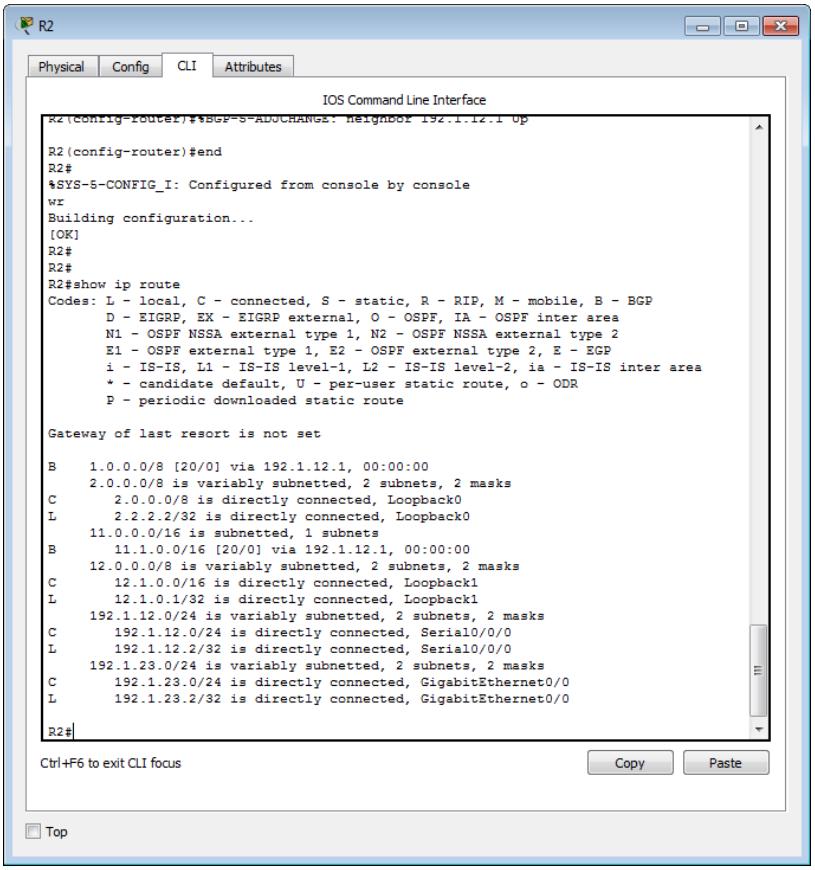
  R2(config-if)#ip address 12.1.0.1 255.255.0.0
- R2(config)#router bgp 65001

  R2(config-router)#neighbor 192.1.12.1 remote-as 65000

  R2(config-router)#bgp router-id 22.22.22.22

  R2(config-router)#network 2.2.2.2 mask 255.0.0.0

R2(config-router)#network 12.1.0.1 mask 255.255.0.0



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)#router bgp 65001

  R2(config-router)#neighbor 192.1.23.3 remote-as 65002

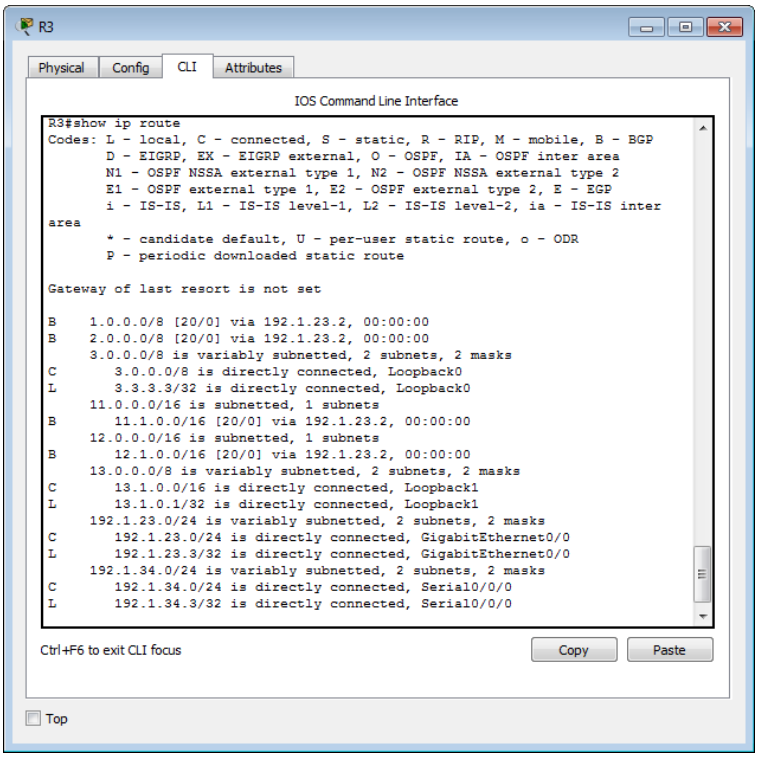
- R3(config)#router bgp 65002

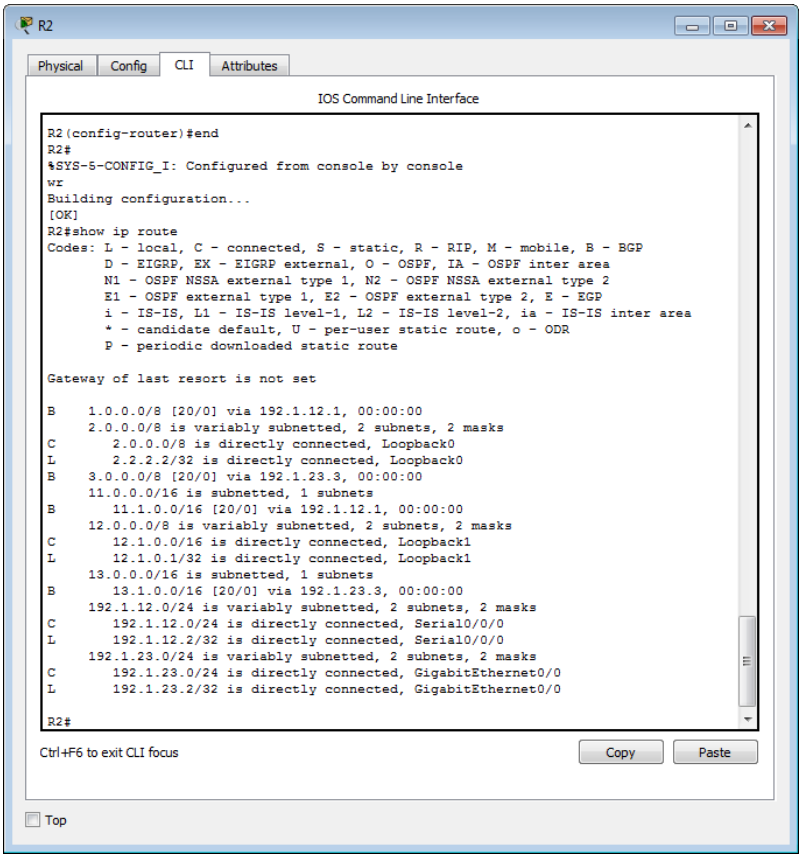
  R3(config-router)#neighbor 192.1.23.2 remote-as 65001

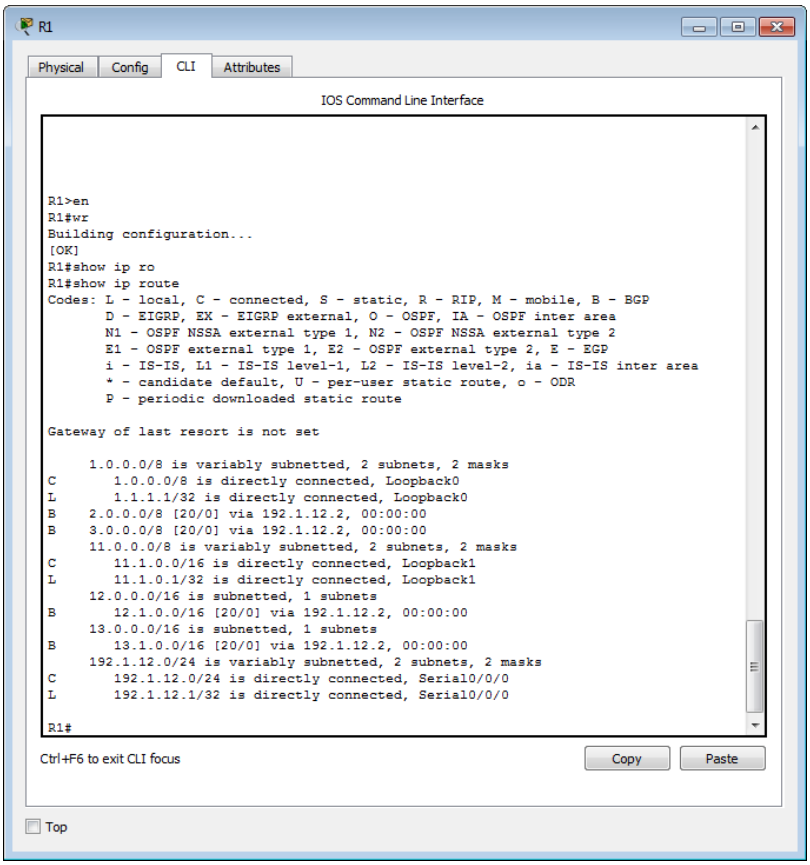
  R3(config-router)#bgp router-id 33.33.33.33

  R3(config-router)#network 3.3.3.3 mask 255.0.0.0

  R3(config-router)#network 13.1.0.1 mask 255.255.0.0




R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
R2(config-router)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
wr
Building configuration...
[OK]
R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
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
192.1.12.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.12.0/24 is directly connected, Serial0/0/0
L 192.1.12.2/32 is directly connected, Serial0/0/0
192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.23.0/24 is directly connected, GigabitEthernet0/0
L 192.1.23.2/32 is directly connected, GigabitEthernet0/0
R2#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


R1
Physical
Config
CLI
Attributes
IOS Command Line Interface
R1>en
R1#wr
Building configuration...
[OK]
R1#show ip ro
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 1.0.0.0/8 is directly connected, Loopback0
L 1.1.1.1/32 is directly connected, Loopback0
B 2.0.0.0/8 [20/0] via 192.1.12.2, 00:00:00
B 3.0.0.0/8 [20/0] via 192.1.12.2, 00:00:00
11.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 11.1.0.0/16 is directly connected, Loopback1
L 11.1.0.1/32 is directly connected, Loopback1
12.0.0.0/16 is subnetted, 1 subnets
B 12.1.0.0/16 [20/0] via 192.1.12.2, 00:00:00
13.0.0.0/16 is subnetted, 1 subnets
B 13.1.0.0/16 [20/0] via 192.1.12.2, 00:00:00
192.1.12.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.12.0/24 is directly connected, Serial0/0/0
L 192.1.12.1/32 is directly connected, Serial0/0/0
R1#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

3. **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.**

- R3(config)# router bgp 65002

  R3(config-router)#neighbor 192.1.34.4 remote-as 65003

- R4(config)#router bgp 65003

  R4(config-router)#neighbor 192.1.34.3 remote-as 65002

  R4(config-router)#neighbor 192.1.34.3 update-source loopback0

  R4(config-router)#neighbor 192.1.34.3 ebgp-multihop 2

  R4(config-router)#bgp router-id 44.44.44.44

  R4(config-router)#network 4.4.4.4 mask 255.0.0.0

  R4(config-router)#network 14.1.0.1 mask 255.255.0.0

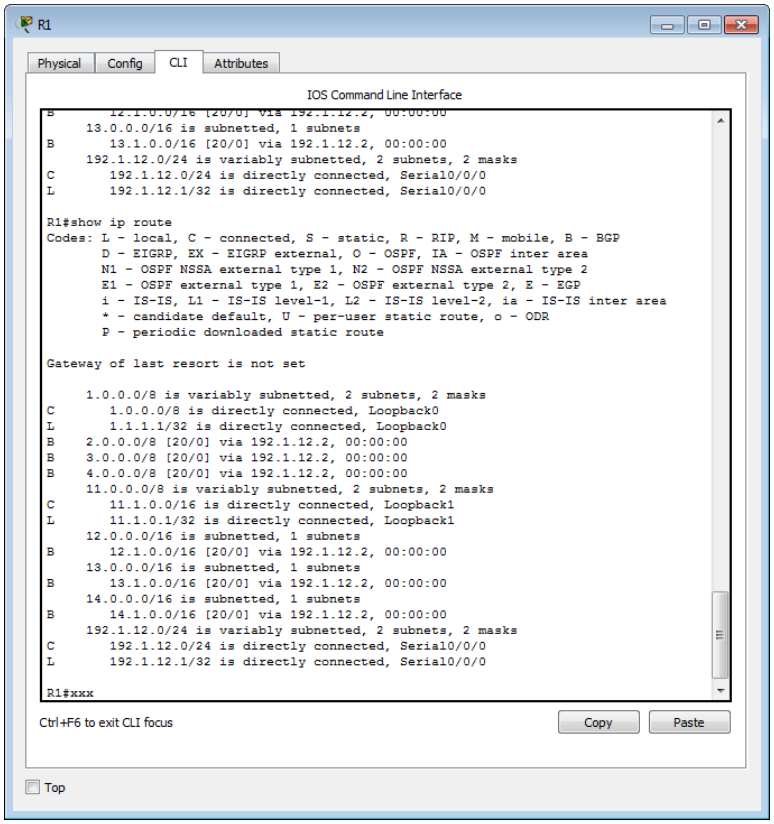
  R4(config-router)#no network 4.4.4.4 mask 255.0.0.0

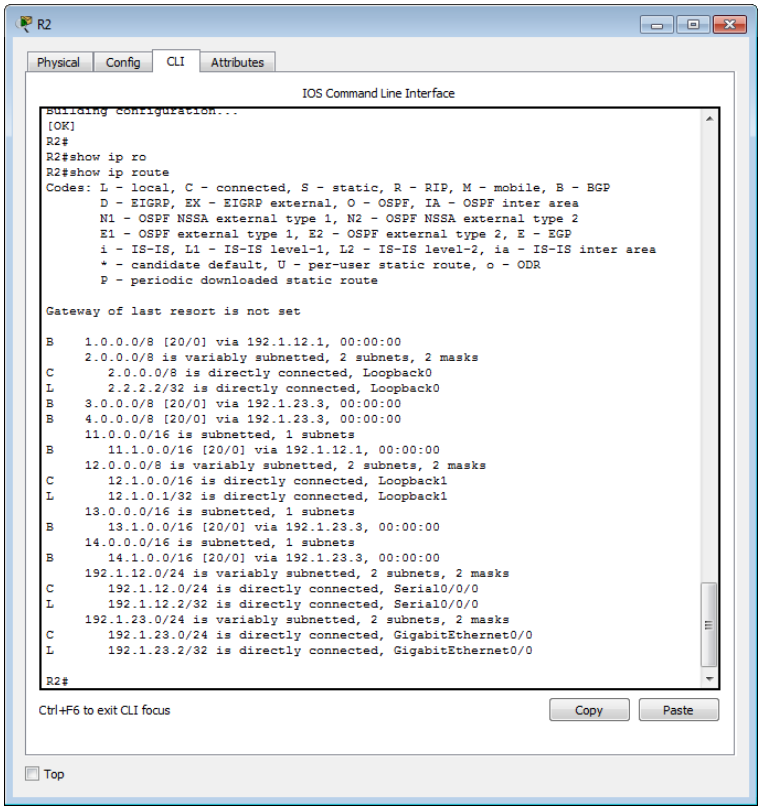
- R3(config)# ip route 4.0.0.0 255.0.0.0 192.1.34.4
- R3(config)#router bgp 65002

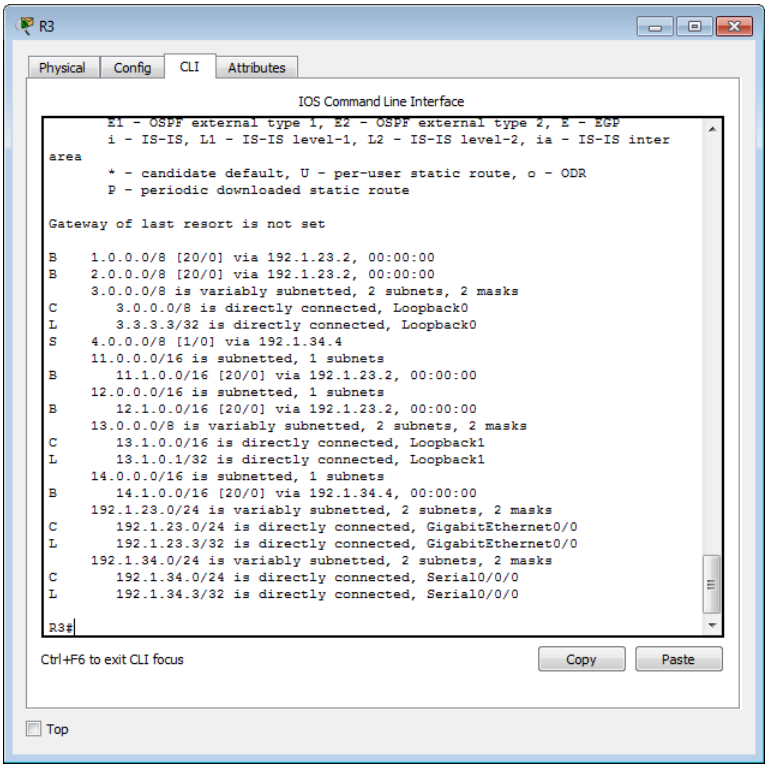
  R3(config)# neighbor 192.1.34.4 update-source loopback0

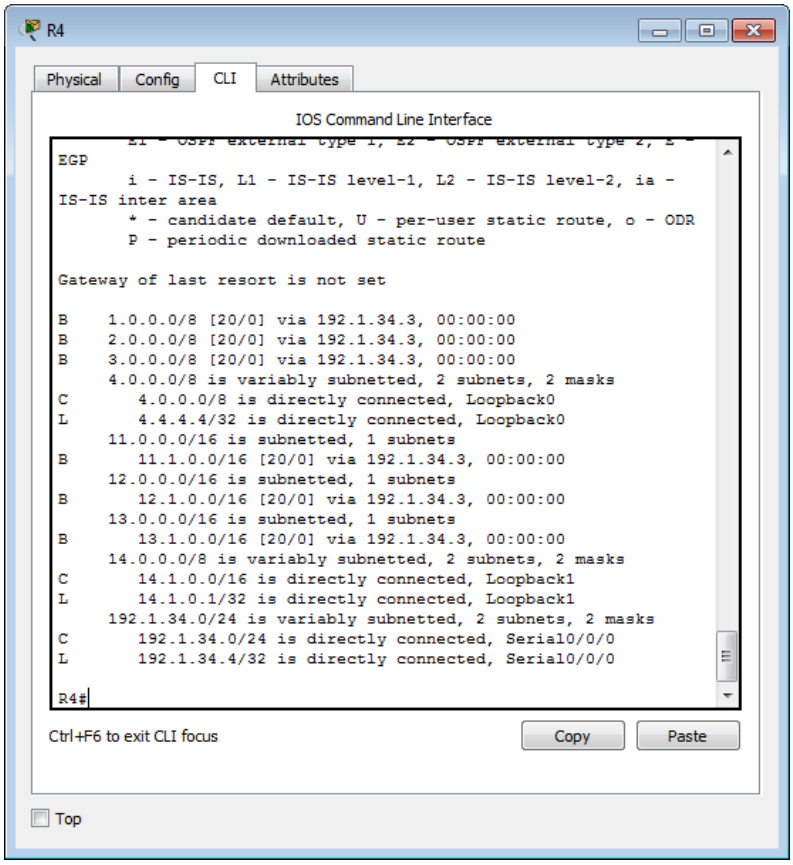
  R3(config)# neighbor 192.1.34.4 ebgp-multihop 2

  R3(config-router)# redistribute static

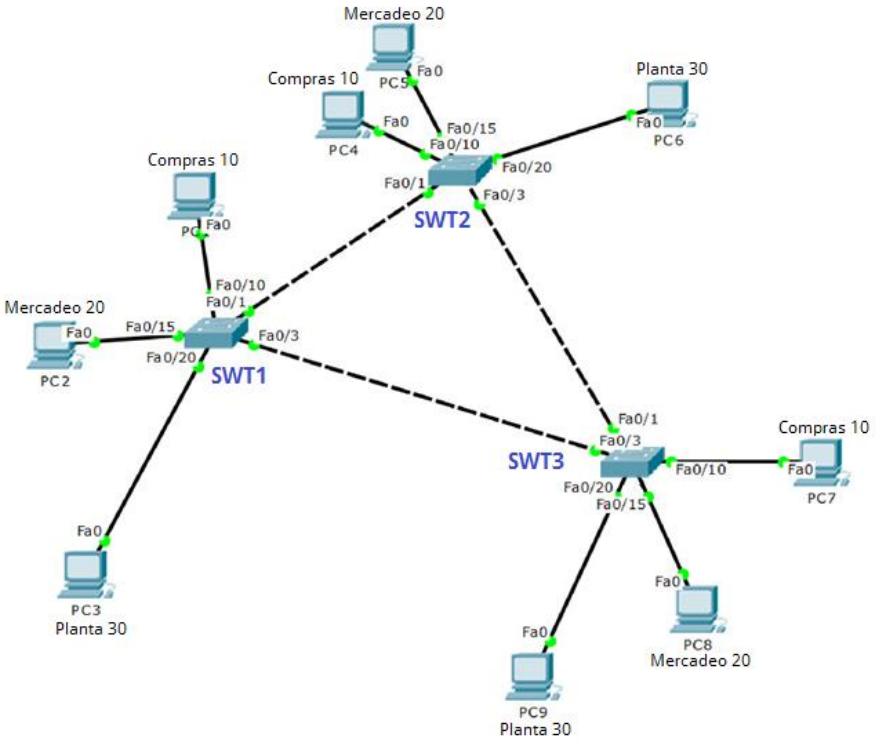



R2
Physical
Config
CLI
Attributes
IOS Command Line Interface
Building configuration...
[OK]
R2#
R2#show ip ro
R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
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
B 4.0.0.0/8 [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
14.0.0.0/16 is subnetted, 1 subnets
B 14.1.0.0/16 [20/0] via 192.1.23.3, 00:00:00
192.1.12.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.12.0/24 is directly connected, Serial0/0/0
L 192.1.12.2/32 is directly connected, Serial0/0/0
192.1.23.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.1.23.0/24 is directly connected, GigabitEthernet0/0
L 192.1.23.2/32 is directly connected, GigabitEthernet0/0
R2#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


R3
Physical
Config
CLI
Attributes
IOS Command Line Interface
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
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
S 4.0.0.0/8 [1/0] via 192.1.34.4
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
14.0.0.0/16 is subnetted, 1 subnets
B 14.1.0.0/16 [20/0] via 192.1.34.4, 00:00:00
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
R3#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


R4
Physical
Config
CLI
Attributes
IOS Command Line Interface
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 192.1.34.3, 00:00:00
B 2.0.0.0/8 [20/0] via 192.1.34.3, 00:00:00
B 3.0.0.0/8 [20/0] via 192.1.34.3, 00:00:00
4.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 4.0.0.0/8 is directly connected, Loopback0
L 4.4.4.4/32 is directly connected, Loopback0
11.0.0.0/16 is subnetted, 1 subnets
B 11.1.0.0/16 [20/0] via 192.1.34.3, 00:00:00
12.0.0.0/16 is subnetted, 1 subnets
B 12.1.0.0/16 [20/0] via 192.1.34.3, 00:00:00
13.0.0.0/16 is subnetted, 1 subnets
B 13.1.0.0/16 [20/0] via 192.1.34.3, 00:00:00
14.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 14.1.0.0/16 is directly connected, Loopback1
L 14.1.0.1/32 is directly connected, Loopback1
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 192.1.34.4/32 is directly connected, Serial0/0/0
R4#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

c. Escenario 3.



- **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 VPT llamado CCNP y usando la contraseña cisco.**

Configuraciones sobre switch SWT1:

- Switch>enable

  Switch#configure terminal

  Switch(config)#hostname SWT1

  SWT1(config)#vtp version 2

  SWT1(config)#vtp domain CCNP

  SWT1(config)#vtp mode client

  SWT1(config)#vtp password cisco

Configuraciones sobre switch SWT2:

- Switch>enable

  Switch#configure terminal

  Switch(config)#hostname SWT2

  SWT2(config)#vtp version 2

  SWT2(config)#vtp domain CCNP

  SWT2(config)#vtp mode server

  SWT2(config)#vtp password cisco

Configuraciones sobre switch SWT3:

- Switch>enable

  Switch#configure terminal

  Switch(config)#hostname SWT3

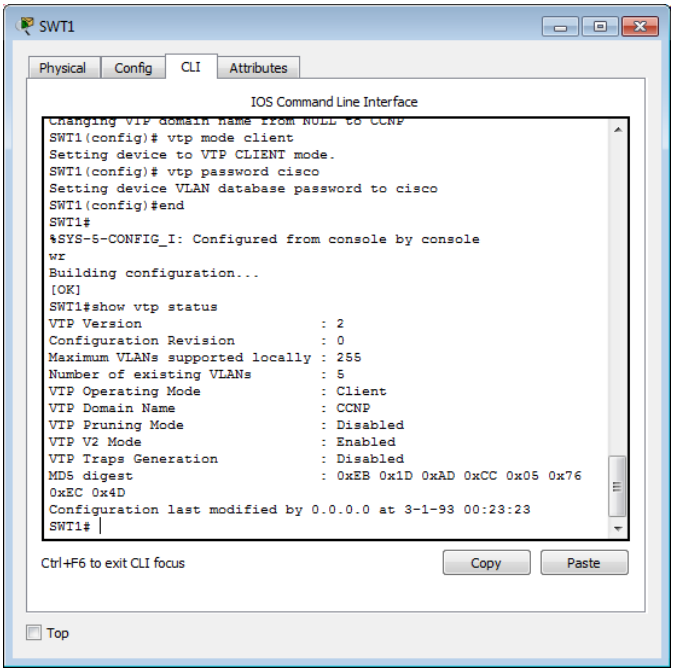
  SWT3(config)#vtp version 2

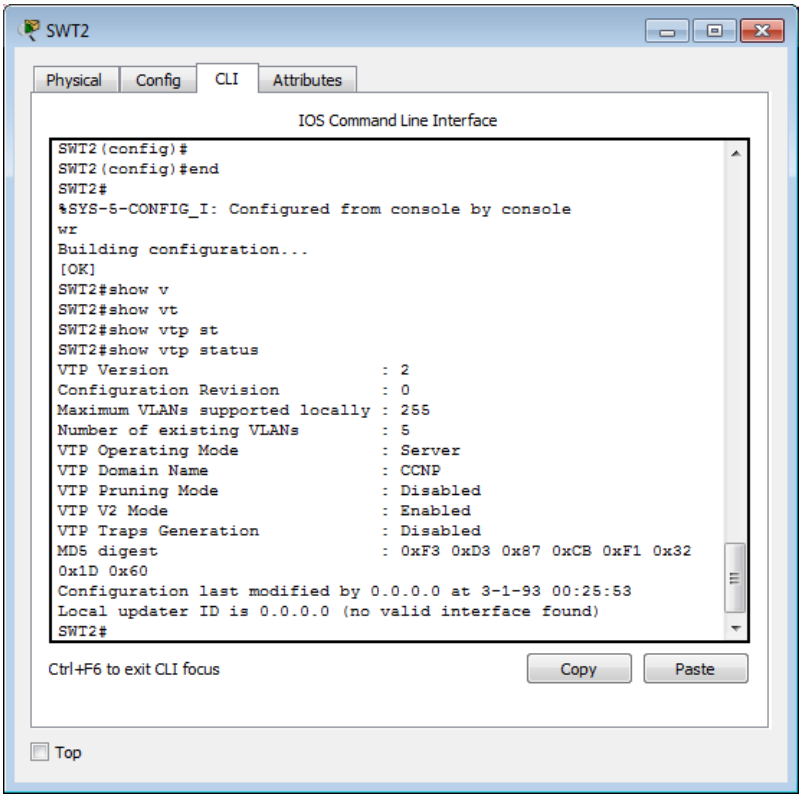
  SWT3(config)#vtp domain CCNP

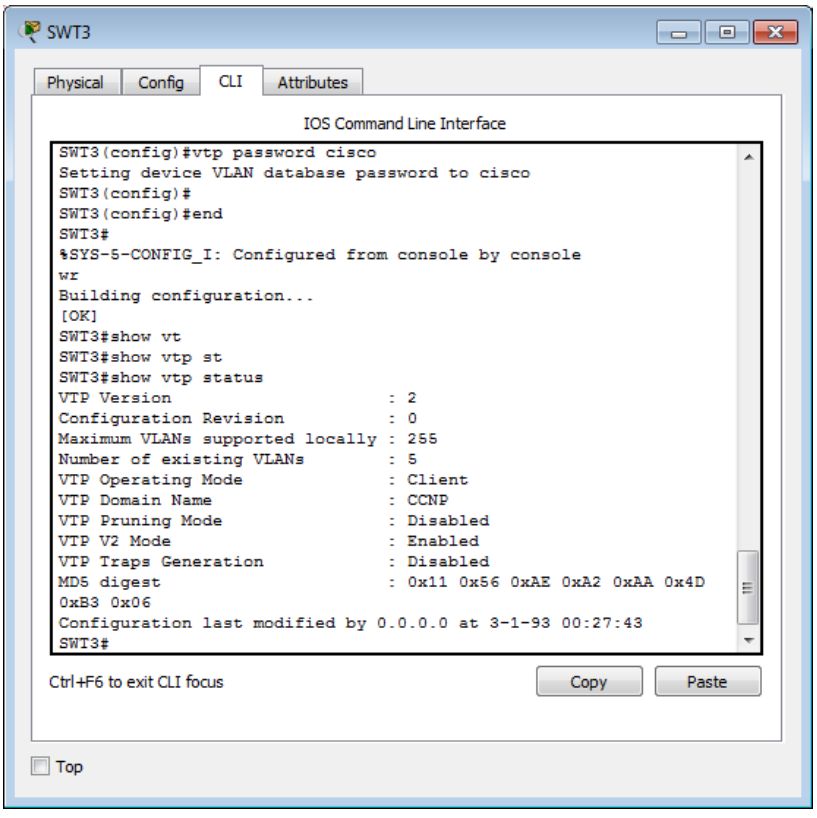
  SWT3(config)#vtp mode client

  SWT3(config)#vtp password cisco

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




SWT2
Physical
Config
CLI
Attributes
IOS Command Line Interface
SWT2(config)#
SWT2(config)#end
SWT2#
%SYS-5-CONFIG_I: Configured from console by console
wr
Building configuration...
[OK]
SWT2#show v
SWT2#show vt
SWT2#show vtp st
SWT2#show vtp status
VTP Version : 2
Configuration Revision : 0
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 : 0xF3 0xD3 0x87 0xCB 0xF1 0x32
0x1D 0x60
Configuration last modified by 0.0.0.0 at 3-1-93 00:25:53
Local updater ID is 0.0.0.0 (no valid interface found)
SWT2#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


SWT3
Physical
Config
CLI
Attributes
IOS Command Line Interface
SWT3(config)#vtp password cisco
Setting device VLAN database password to cisco
SWT3(config)#
SWT3(config)#end
SWT3#
%SYS-5-CONFIG_I: Configured from console by console
wr
Building configuration...
[OK]
SWT3#show vt
SWT3#show vtp st
SWT3#show vtp status
VTP Version : 2
Configuration Revision : 0
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 : 0x11 0x56 0xAE 0xA2 0xAA 0x4D
0xB3 0x06
Configuration last modified by 0.0.0.0 at 3-1-93 00:27:43
SWT3#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

- **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.**

Configuraciones sobre switches SWT1/SWT2:

- SWT1>enable

  SWT1#configure terminal

  SWT1(config)#interface FastEthernet0/1

  SWT1(config)#switchport mode dynamic desirable

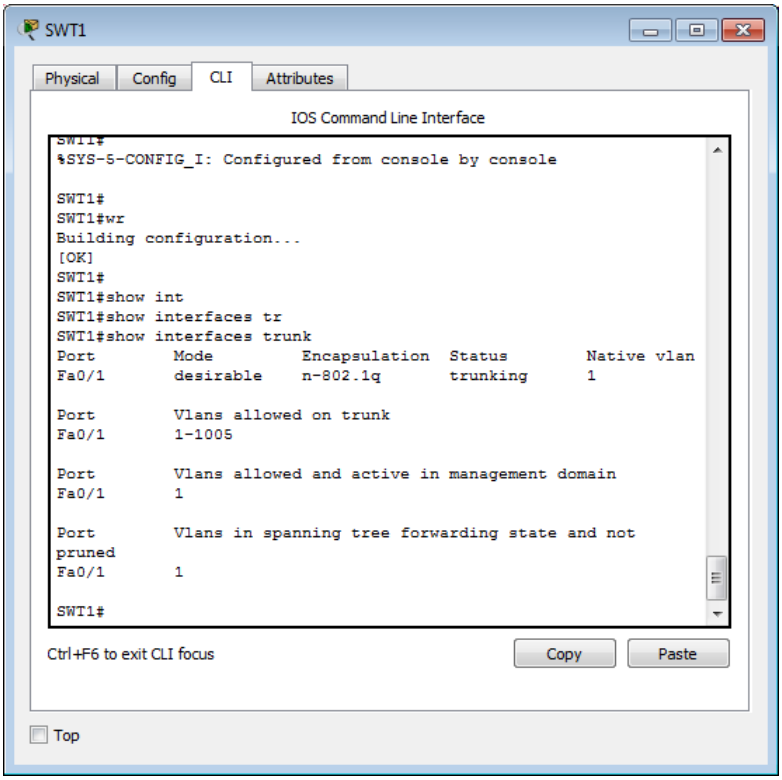
- SWT2>enable

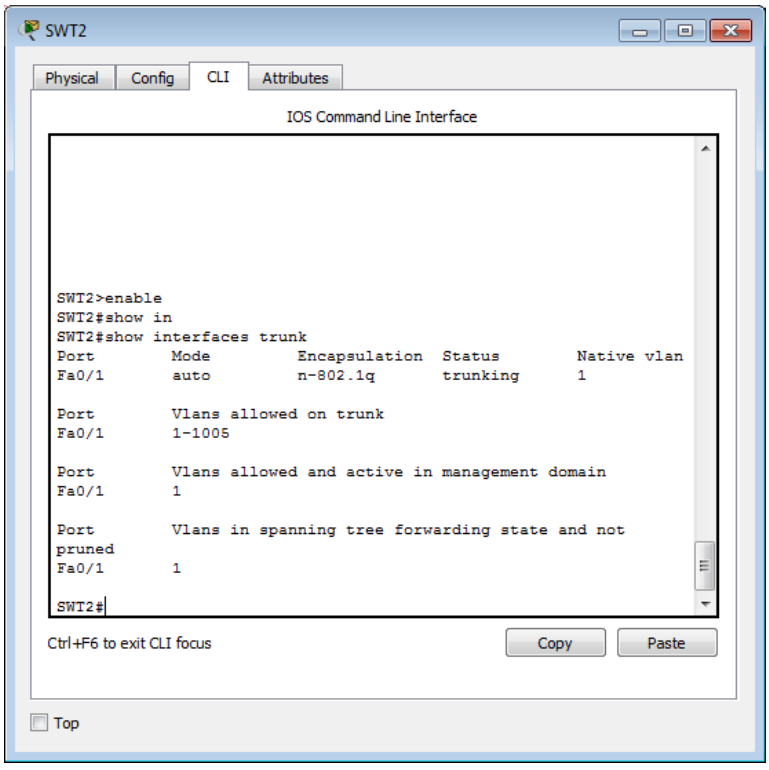
  SWT2#configure terminal

  SWT2(config)#interface FastEthernet0/1

  SWT2(config)#switchport mode dynamic auto

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


SWT1
Physical
Config
CLI
Attributes
IOS Command Line Interface
%SYS-5-CONFIG_I: Configured from console by console
SWT1#
SWT1#wr
Building configuration...
[OK]
SWT1#
SWT1#show int
SWT1#show interfaces tr
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#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


SWT2
Physical
Config
CLI
Attributes
IOS Command Line Interface
SWT2>enable
SWT2#show in
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 1
SWT2#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

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

Configuraciones sobre switches SWT1/SWT3:

- SWT1>enable

  SWT1#configure terminal

  SWT1(config)#interface FastEthernet0/3

  SWT1(config)#switchport mode trunk

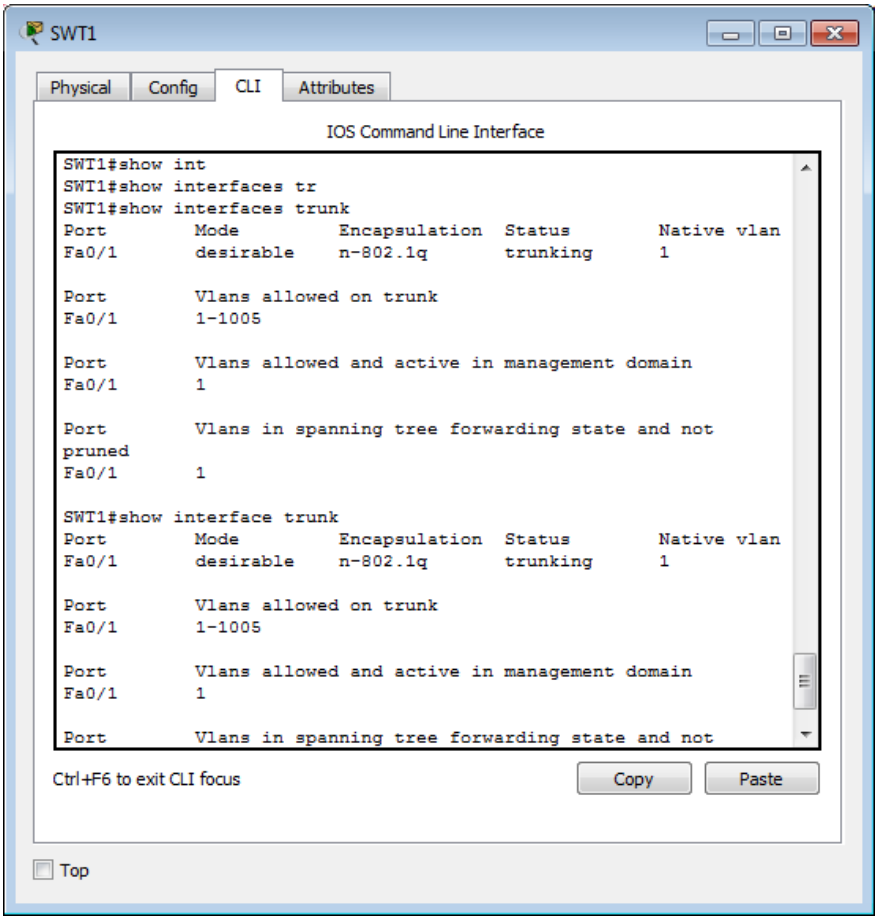
- SWT3>enable

  SWT3#configure terminal

  SWT3(config)#interface FastEthernet0/3

  SWT3(config)#switchport mode dynamic auto

4. **Verifique el enlace "trunk" el comando show interfaces trunk en SWT1.**



5. **Configure un enlace "trunk" permanente entre SWT2 y SWT3.**

Configuraciones sobre switches SWT2/SWT3:

- SWT2>enable

  SWT2#configure terminal

  SWT2(config)#interface FastEthernet0/3

  SWT2(config)#switchport mode trunk

- SWT3>enable

  SWT3#configure terminal

  SWT3(config)#interface FastEthernet0/1

  SWT3(config)#switchport mode trunk

➢ **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>enable

  SWT1#configure terminal

  SWT1(config)#vlan 10

- SWT2>enable

  SWT2#configure terminal

  SWT2(config)#vlan 10

  SWT2(config-vlan)#name Compras

  SWT2(config-vlan)#exit

SWT2(config)#vlan 20

SWT2(config-vlan)#name Mercadeo

SWT2(config-vlan)#exit

SWT2(config)#vlan 30

SWT2(config-vlan)#name Planta

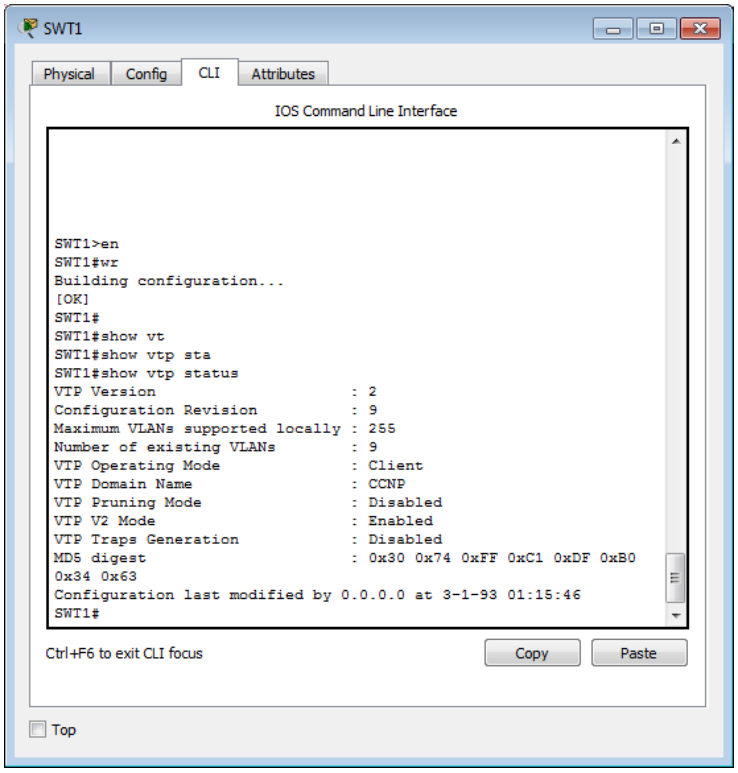
SWT2(config-vlan)#exit

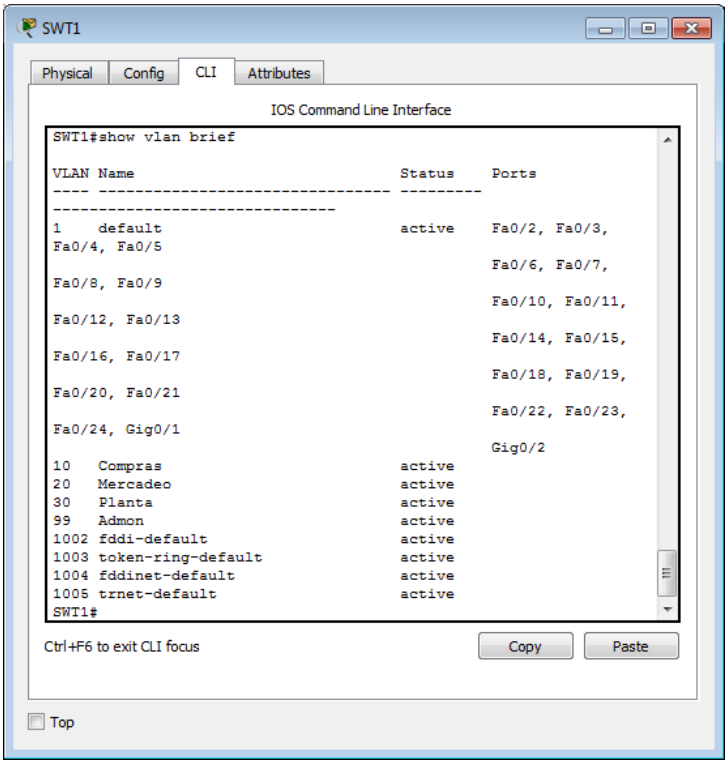
SWT2(config)#vlan 99

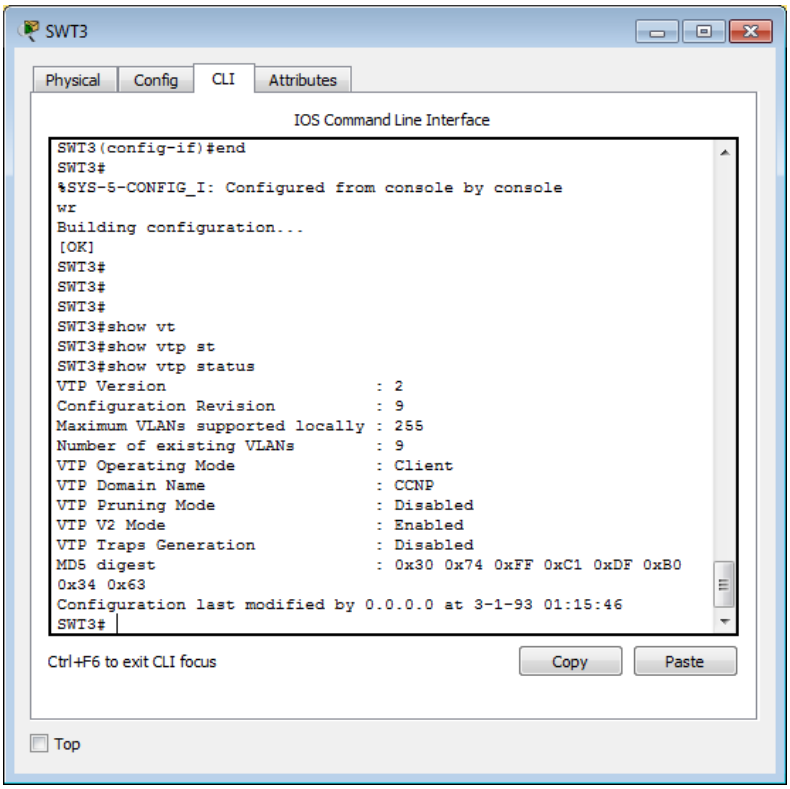
SWT2(config-vlan)#name Admon

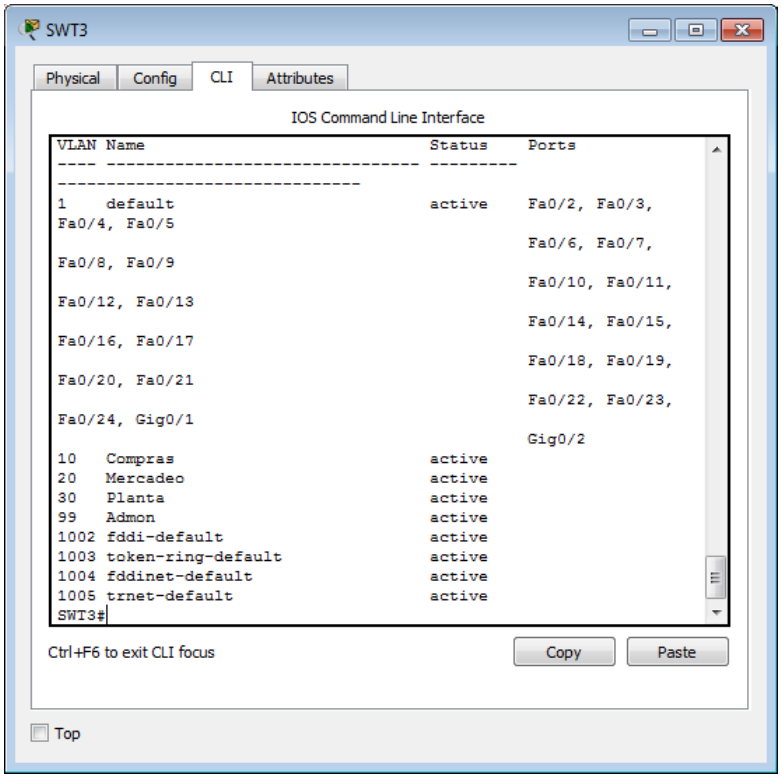
SWT2(config-vlan)#exit

2. **Verifique que las VLANs han sido agregadas correctamente.**




SWT1
Physical
Config
CLI
Attributes
IOS Command Line Interface
SWT1#show vlan brief
VLAN Name Status Ports
---- -------------------------------- --------- -------------------------------
1 default active Fa0/2, Fa0/3, Fa0/4, Fa0/5
Fa0/6, Fa0/7, Fa0/8, Fa0/9
Fa0/10, Fa0/11, Fa0/12, Fa0/13
Fa0/14, Fa0/15, Fa0/16, Fa0/17
Fa0/18, Fa0/19, Fa0/20, Fa0/21
Fa0/22, Fa0/23, Fa0/24, Gig0/1
Gig0/2
10 Compras active
20 Mercadeo active
30 Planta active
99 Admon active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
SWT1#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


SWT3
Physical
Config
CLI
Attributes
IOS Command Line Interface
SWT3(config-if)#end
SWT3#
%SYS-5-CONFIG_I: Configured from console by console
wr
Building configuration...
[OK]
SWT3#
SWT3#
SWT3#
SWT3#show vt
SWT3#show vtp st
SWT3#show vtp status
VTP Version : 2
Configuration Revision : 9
Maximum VLANs supported locally : 255
Number of existing VLANs : 9
VTP Operating Mode : Client
VTP Domain Name : CCNP
VTP Pruning Mode : Disabled
VTP V2 Mode : Enabled
VTP Traps Generation : Disabled
MD5 digest : 0x30 0x74 0xFF 0xC1 0xDF 0xB0 0x34 0x63
Configuration last modified by 0.0.0.0 at 3-1-93 01:15:46
SWT3#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top



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

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

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

- SWT3>enable

  SWT3#configure terminal

  SWT3(config)#interface FastEthernet0/10

  SWT3(config-if)#switchport mode access

  SWT3(config-if)#switchport access vlan 10

  SWT3(config-if)#switchport nonegotiate

  SWT3(config-if)#spanning-tree portfast

- SWT1>enable

  SWT1#configure terminal

  SWT1(config)#interface FastEthernet0/10

  SWT1(config-if)#switchport mode access

  SWT1(config-if)#switchport access vlan 10

  SWT1(config-if)#switchport nonegotiate

  SWT1(config-if)#spanning-tree portfast

- SWT2>enable

  SWT2#configure terminal

  SWT2(config)#interface FastEthernet0/10

  SWT2(config-if)#switchport mode access

SWT2(config-if)#switchport access vlan 10

SWT2(config-if)#switchport nonegotiate

SWT2(config-if)#spanning-tree portfast

5. **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.**

- SWT3>enable

  SWT3#configure terminal

  SWT3(config)#interface FastEthernet0/15

  SWT3(config-if)#switchport mode access

  SWT3(config-if)#switchport access vlan 20

  SWT3(config-if)#switchport nonegotiate

  SWT3(config-if)#spanning-tree portfast

  SWT3(config)#interface FastEthernet0/20

  SWT3(config-if)#switchport mode access

  SWT3(config-if)#switchport access vlan 30

  SWT3(config-if)#switchport nonegotiate

  SWT3(config-if)#spanning-tree portfast

- SWT1>enable

  SWT1#configure terminal

  SWT1(config)#interface FastEthernet0/15

  SWT1(config-if)#switchport mode access

  SWT1(config-if)#switchport access vlan 20

  SWT1(config-if)#switchport nonegotiate

  SWT1(config-if)#spanning-tree portfast

  SWT1(config)#interface FastEthernet0/20

  SWT1(config-if)#switchport mode access

  SWT1(config-if)#switchport access vlan 30

  SWT1(config-if)#switchport nonegotiate

  SWT1(config-if)#spanning-tree portfast

- SWT2>enable

  SWT2#configure terminal

  SWT2(config-if)#spanning-tree portfast

  SWT2(config)#interface FastEthernet0/15

  SWT2(config-if)#switchport mode access

  SWT2(config-if)#switchport access vlan 20

  SWT2(config-if)#switchport nonegotiate

SWT2(config-if)#spanning-tree portfast

SWT2(config)#interface FastEthernet0/20

SWT2(config-if)#switchport mode access

SWT2(config-if)#switchport access vlan 30

SWT2(config-if)#switchport nonegotiate

SWT2(config-if)#spanning-tree portfast

- **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.**

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>enable

SWT1#configure terminal

SWT1(config)#interface vlan99

SWT1(config-if)#ip address 190.108.99.1 255.255.255.0

- SWT2>enable

  SWT2#configure terminal

  SWT2(config)#interface vlan99

  SWT2(config-if)#ip address 190.108.99.2 255.255.255.0

- SWT3>enable

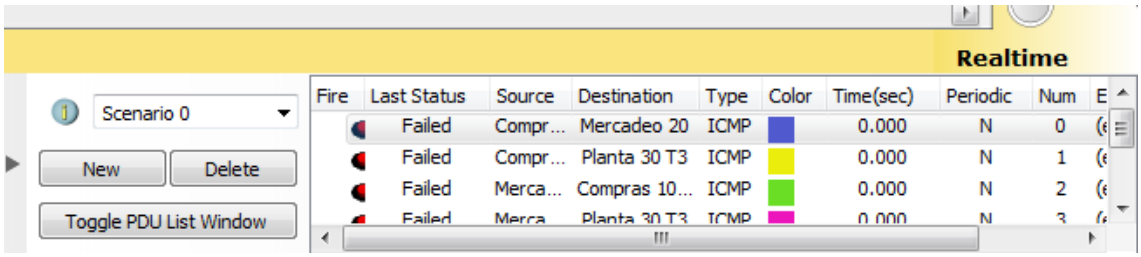
  SWT3#configure terminal

  SWT3(config)#interface vlan99

  SWT3(config-if)#ip address 190.108.99.3 255.255.255.0

➢ **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.**



R// Se tuvo éxito entre los PC de las misma VLAN por estar en el mismo dominio de broadcast; sin embargo, entre máquinas de otras VLAN no es exitoso

porque no existe un dispositivo de capa 3 que permita realizar la conmutación INTERVLAN.

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

```
SWT1#ping 190.108.99.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 190.108.99.2, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 0/0/0 ms

SWT1#ping 190.108.99.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 190.108.99.3, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 0/1/3 ms

SWT1#
```

R// Se tuvo éxito entre los PC de las misma VLAN por estar en el mismo dominio de broadcast.

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

```
SWT1#ping 190.108.10.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 190.108.10.10, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

SWT1#ping 190.108.20.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 190.108.20.10, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

SWT1#ping 190.108.30.10

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 190.108.30.10, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

SWT1#
```

R// No se tuvo éxito en el ping entre los switches y las máquinas ya que se encuentran en otros dominio de broadcast y no existe un dispositivo de capa 3 que permita realizar la conmutación INTERVLAN.

3. CONCLUSIONES.

- Se pudo comprender los conceptos fundamentales de enrutamiento y conmutación como características de protocolos de enrutamiento y conceptos de conectividad de sitio remoto, diseño de redes de campus, enlaces redundantes entre otros conceptos.

- Se adquirieron conocimientos básicos y avanzados para entender los protocolos de Enrutamiento IGP como RIP, EIGRP, OSPF e incluso IPv6 y comprender tecnologías de capa 2 como lo son VTP, STP, DTP, FHRP, VACL entre otros.

- Se comprendieron conceptos para realizar la redistribución y selección de rutas de protocolos de enrutamiento de vector distancia y estado enlace. Y a nivel de capa 2 comprendiendo el funcionamiento de tecnologías para proporcionar redundancia y alta disponibilidad como etherchannel o FHRP.

- Se pudo adquirir comprensión de conceptos de conectividad de internet como lo son IPv6 y el EGP de vector ruta MP-BGP.

- Se adquirieron conceptos de fortificación de servicios de red como lo son autenticación de protocolos de enrutamiento e implementación de tecnologías de seguridad de capa 2.

4. BIBLIOGRAFÍA.

"Búsqueda Básica: EBSCOhost." Accessed December 5, 2018. https://bibliotecavirtual.unad.edu.co:2968/ehost/search/basic?vid=0&sid=f0f02246-d16c-48fc-bf3b-4165ed399aa2%40pdc-v-sessmgr06.

"Búsqueda Básica: EBSCOhost." Accessed December 5, 2018. https://bibliotecavirtual.unad.edu.co:2968/ehost/search/basic?vid=0&sid=1eaf5e18-a9e6-41c5-b547-bfbc3ac5930d%40sessionmgr104.

"CCNA Electronic Book 6th Edition.Pdf." Accessed December 5, 2018. http://www.birminghamcharter.com/ourpages/auto/2012/3/22/41980164/CCNA%20Electronic%20Book%206th%20edition.pdf.

"CCNP R&S ROUTE 300-101 Foundation Learning Guide.Pdf - OneDrive." Accessed December 5, 2018. https://onedrive.live.com/?authkey=%21AB%5FLauE9kfAShbE&cid=483D35BEE8610962&id=483D35BEE8610962%212931&parId=483D35BEE8610962%212930&o=OneUp.

"CCNP R&S SWITCH 300-115 Foundation Learning Guide.Pdf - OneDrive." Accessed December 5, 2018. https://onedrive.live.com/?authkey=%21AJHSGgzGAE2%5FUIk&cid=483D35BEE8610962&id=483D35BEE8610962%212933&parId=483D35BEE8610962%212932&o=OneUp.

"CCNP R&S SWITCH 300-115 Foundation Learning Guide.Pdf - OneDrive." Accessed December 5, 2018. https://onedrive.live.com/?authkey=%21AJHSGgzGAE2%5FUIk&cid=483D35BEE8610962&id=483D35BEE8610962%212933&parId=483D35BEE8610962%212932&o=OneUp.

"Lammle - 2007 - CCNA Cisco Certified Network Associate Study Guide.Pdf." Accessed December 5, 2018. http://www.birminghamcharter.com/ourpages/auto/2012/3/22/41980164/CCNA%20Electronic%20Book%206th%20edition.pdf.

"Lammle - 2007 - CCNA Cisco Certified Network Associate Study Guide.Pdf." Accessed December 5, 2018. http://www.birminghamcharter.com/ourpages/auto/2012/3/22/41980164/CCNA%20Electronic%20Book%206th%20edition.pdf.

Lammle, Todd. *CCNA Cisco Certified Network Associate Study Guide*. 6th ed. Indianapolis, Ind: Wiley Pub, 2007.

———. *CCNA Cisco Certified Network Associate Study Guide*. 6th ed. Indianapolis, Ind: Wiley Pub, 2007.

———. *CCNA Cisco Certified Network Associate Study Guide*. 6th ed. Indianapolis, Ind: Wiley Pub, 2007.

"Network Routing Basics : Understanding IP Routing in Cisco Systems: EBSCOhost." Accessed December 5, 2018. https://bibliotecavirtual.unad.edu.co:2968/ehost/detail/detail?vid=0&sid=9fcff32c-981d-

42d0-9ab0-62eb4274388d%40sessionmgr120&bdata=Jmxhbmc9ZXMmc2l0ZT1laG9zdC1saXZl.

"Odom - 2008 - CCNA ICND2 Official Exam Certification Guide.Pdf." Accessed December 5, 2018. http://een.iust.ac.ir/profs/Beheshti/Computer%20networking/Auxilary%20materials/Cisco-ICND2.pdf.

"Odom - 2008 - CCNA ICND2 Official Exam Certification Guide.Pdf." Accessed December 5, 2018. http://een.iust.ac.ir/profs/Beheshti/Computer%20networking/Auxilary%20materials/Cisco-ICND2.pdf.

"Odom - 2016 - CCENTCCNA ICND1 100-105 Official Cert Guide.Pdf." Accessed December 5, 2018. http://ptgmedia.pearsoncmg.com/images/9781587205804/samplepages/9781587205804.pdf.

"Odom - 2016 - CCENTCCNA ICND1 100-105 Official Cert Guide.Pdf." Accessed December 5, 2018. http://ptgmedia.pearsoncmg.com/images/9781587205804/samplepages/9781587205804.pdf.

Odom, Wendell. *CCENT/CCNA ICND1 100-105 Official Cert Guide*. 1st. edition. Indianapolis, IN: Cisco Press, 2016.

———. *CCENT/CCNA ICND1 100-105 Official Cert Guide*. 1st. edition. Indianapolis, IN: Cisco Press, 2016.

———. *CCNA ICND2 Official Exam Certification Guide*. 2nd ed. Indianapolis, IN: Cisco Press, 2008.

———. *CCNA ICND2 Official Exam Certification Guide*. 2nd ed. Indianapolis, IN: Cisco Press, 2008.

"OneDrive." Accessed December 5, 2018. https://onedrive.live.com/?cid=483d35bee8610962&id=483D35BEE8610962%21770&authkey=!AP1AKEPWb0S4aoI.

"VIDEO5.Enrutamiento_Basico.Flv - OneDrive." Accessed December 5, 2018. https://onedrive.live.com/?authkey=%21ALKNZ6Hq2KaL9OY&cid=483D35BEE8610962&id=483D35BEE8610962%21771&parId=483D35BEE8610962%21767&action=defaultclick.

"VIDEOS INICIALES CISCO - OneDrive." Accessed December 5, 2018. https://onedrive.live.com/?authkey=%21ABGiHC3A9RXrh2A&id=483D35BEE8610962%21767&cid=483D35BEE8610962.

Accessed December 5, 2018. http://ptgmedia.pearsoncmg.com/images/9781587205804/samplepages/.