DIPLOMADO DE PROFUNDIZACIÓN CISCO CCNP
SOLUCIÓN DE DOS ESCENARIOS PRESENTES EN ENTORNOS CORPORATIVOS BAJO EL USO DE TECNOLOGÍA CISCO

LUIS OLMEDO FERNÁNDEZ MENSA

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA-ECBTI
INGENIERÍA DE TELECOMUNICACIONES
BOGOTÁ DC.
2020

DIPLOMADO DE PROFUNDIZACIÓN CISCO CCNP
SOLUCIÓN DE DOS ESCENARIOS PRESENTES EN ENTORNOS CORPORATIVOS BAJO EL USO DE TECNOLOGÍA CISCO

LUIS OLMEDO FERNÁNDEZ MENSA

Diplomado de opción de grado presentado para optar el título de INGENIERO EN TELECOMUNICACIONES

DIRECTOR:
MSc. GERARDO GRANADOS ACUÑA

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA-ECBTI
INGENIERÍA DE TELECOMUNICACIONES
BOGOTÁ DC.
2020

NOTA DE ACEPTACIÓN

Firma del Presidente del Jurado

Firma del Jurado

Firma del Jurado

BOGOTÁ DC., 30 de Noviembre de 2020

AGRADECIMIENTOS

En primero lugar quiero agradecer al tutor MSc. Gerardo Granados Acuña director de la Materia quien con su experiencia e idoneidad me oriento durante el tiempo de estudio para alcanzar los fines que esperaba en la construcción de este proyecto.

También quiero agradecer a mis compañeros de estudio que estuvieron presentes en los desarrollos de cada una de las etapas de este objetivo consiguiendo terminar de manera satisfactoria la meta propuesta.

Por ultimo quiero agradecer amigos cercanos en especial a mi familia que siempre confiaron en mí, en mi sacrificio, esfuerzo y estuvieron pendientes con su apoyo y animo en este proceso de formación.

CONTENIDO

LISTA DE TABLAS

LISTA DE FIGURAS

Pág.

GLOSARIO

CISCO.
Es una empresa de origen Estadounidense fabricante de dispositivos para redes locales y externa, también presta el servicio de soluciones de red, su objetivo es conectar a todos y demostrar las cosas asombrosas que se pueden lograr con una visión clara del futuro.

CCNP.
El termino es de las siglas de Cisco Certified Networking Professional, es decir, un certificado de Networking y telecomunicaciones, como veíamos antes con la CCNA, solo que esta vez hay un elemento decisivo que lo diferencia y separa ambas categorías. Este elemento es la P de las siglas, la palabra profesional indica que no se trata de Associate o nivel básico y medio, sino de uno más profesional y avanzado.

ROUTING
Es el proceso que permite que los paquetes IP enviados por el host origen lleguen al host destino de forma adecuada.

REDES.
Es un conjunto nodos y programas interconectados entre sí por medio de dispositivos físicos o inalámbricos que envían y reciben datos, con la finalidad de compartir información para el servicio de manera efectiva.

TOPOLOGÍA.
Se trata de un mapa físico o lógico de una red para intercambiar datos, de acuerdo a la tipo en que se haya diseñado según la necesidad.

ELECTRÓNICA.
Se tratas de circuitos eléctricos que involucran componentes asociados a elementos activos y pasivos según la implementación en una interconexión tecnológica.

ANCHO DE BANDA
Se trata de la cantidad de datos que puede ser enviada o recibida durante un cierto tiempo a través de un determinado circuito de comunicación

PROTOCOLO.
De uso bidireccional en origen o destino de comunicación para transmitir datos mediante una conexión que transfiere paquetes conmutados a través de distintas redes físicas previamente enlazadas.

RESUMEN

Escenario 1: Se aplica las configuraciones iniciales de los protocolos de enrutamiento y conmutación para los routers R1, R2, R3, R4 y R5 según el diagrama del escenario, donde, no se asignan claves a los routers y configuración de interfaces con las direcciones que se muestran en la topología de red en los medios de la electrónica.

Así mismo se crea cuatro nuevas interfaces de Loopback en R1 utilizando la asignación de direccionamiento 10.1.0.0/22 y configuraciones de interfaces para participar en el área 5 de OSPF. Se crean cuatro nuevas interfaces de Loopback en R5 utilizando la asignación de direcciones 172.5.0.0/22 y configuración de interfaces para participar en el Sistema Autónomo EIGRP 15.

Se analiza la tabla de enrutamiento de R3 y verifica que R3 está aprendiendo las nuevas interfaces de Loopback del mismo modo se configura R3 para redistribuir las rutas EIGRP en OSPF usando el costo de 50000 y luego se redistribuye las rutas OSPF en EIGRP usando un ancho de banda T1 y 20,000 microsegundos de retardo, para posterior verificar en R1 y R5 que las rutas del sistema autónomo opuesto existen en su tabla de enrutamiento.

Escenario 2: Una empresa de comunicaciones presenta una estructura Core acorde a la topología de redes, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, Ether-channels, VLANs y demás aspectos que forman parte del escenario propuesto por el documento final del curso de CCNP en el programa de CISCO.

Palabras Clave: CISCO, CCNP, Conmutación, Enrutamiento, Redes, Electrónica.

ABSTRACT

Scenario 1: The initial configurations of the routing and switching protocols for the routers R1, R2, R3, R4 and R5 are applied according to the diagram of the scenario, where, keys are not assigned to the routers and interface configuration with the addresses that they are shown in the network topology on the electronics media.
Likewise, four new loopback interfaces are created on R1 using the 10.1.0.0/22 addressing assignment and interface configurations to participate in OSPF area 5. Four new loopback interfaces are created on R5 using the 172.5.0.0/22 address assignment and interface configuration to participate in the EIGRP 15 Autonomous System.
R3's routing table is analyzed and verifies that R3 is learning the new loopback interfaces in the same way R3 is configured to redistribute EIGRP routes in OSPF using the cost of 50,000 and then redistribute OSPF routes in EIGRP using a width of T1 band and 20,000 microseconds of delay, to later verify in R1 and R5 that the routes of the opposite autonomous system exist in its routing table.

Scenario 2: A communications company presents a Core structure according to the network topology, where the student will be the network administrator, who must configure and interconnect each of the devices that are part of the scenario, according to the guidelines established for IP addressing, Ether-channels, VLANs and other aspects that are part of the scenario proposed by the final document of the CCNP course in the CISCO program.

Keywords: CISCO, CCNP, Routing, Swicthing, Networking, Electronics.

INTRODUCCIÓN

En el presente trabajo se busca crear de manera práctica las etapas que se desarrollaron en el diplomado de profundización en redes Cisco Networking con el objetivo de extraer datos vistos de las unidades 1 a la 10 donde se resaltan temas de implementación de protocolos y las dos topologías de redes con diferentes exigencias de conexión y condiciones de implementación, las cuales quedaran plasmadas en este documento por medio de la simulación en el software packet tracer y GSN3.

Para el planteamiento del escenario N° 1, Se aplica las configuraciones iniciales de los protocolos de enrutamiento y conmutación para los routers del diagrama donde, no se le asignan claves a los routers y configuración de interfaces con las direcciones que se muestran en la topología, así mismo se crea cuatro nuevas interfaces de Loopback en R1 utilizando la asignación de direcciones 10.1.0.0/22 y configuraciones de interfaces para participar en el área 5 de OSPF, también se crean cuatro nuevas interfaces de Loopback en R5 utilizando la asignación de direcciones 172.5.0.0/22 y configuración de interfaces para participar en el Sistema Autónomo EIGRP 15, del mismo modo se analiza la tabla de enrutamiento de R3 y se verifica que R3 está aprendiendo las nuevas interfaces de Loopback, así mismo se configura R3 para redistribuir las rutas EIGRP en OSPF usando el costo de 50000 y luego se redistribuye las rutas OSPF en EIGRP usando un ancho de banda T1 y 20,000 microsegundos de retardo, para posterior verificar en R1 y R5 que las rutas del sistema autónomo opuesto existen en su tabla de enrutamiento, siendo este el paso del primer ejercicio.

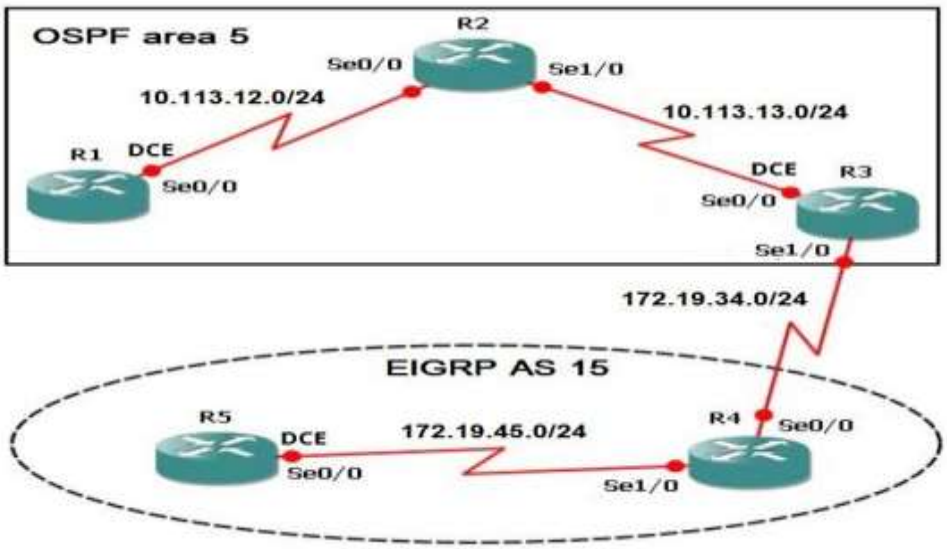
Para el desarrollo del escenario N° 2 se tratara de una empresa de comunicaciones que presenta una estructura Core acorde a la topología de redes, en donde se deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, Ether-channels, VLANs y demás aspectos que forman parte del escenario propuesto por el documento final del curso de CCNP.

DESARROLLO

1. ESCENARIO 1

Teniendo en la cuenta la siguiente imagen:

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.

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 5 de OSPF.

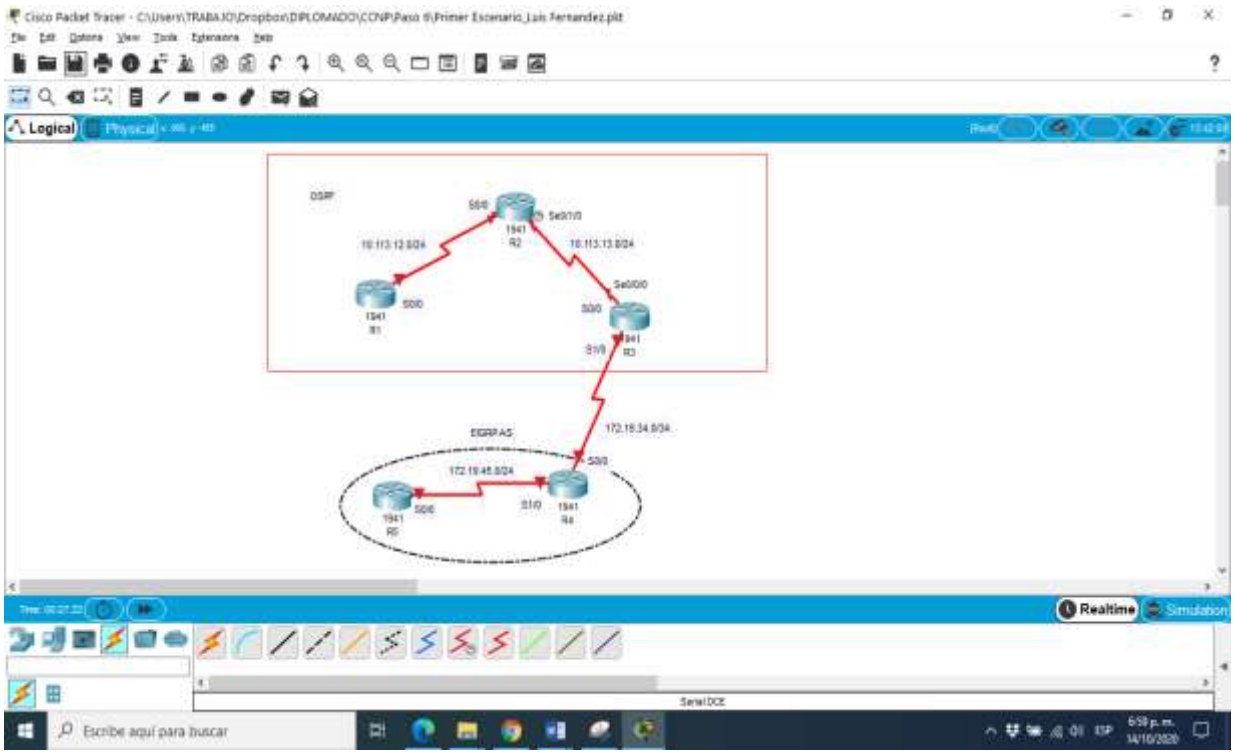
3. Cree cuatro nuevas interfaces de Loopback en R5 utilizando la asignación de direcciones 172.5.0.0/22 y configure esas interfaces para participar en el Sistema Autónomo EIGRP 15.

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.

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.**

Figura 2. Simulación de 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.

Solución punto 1

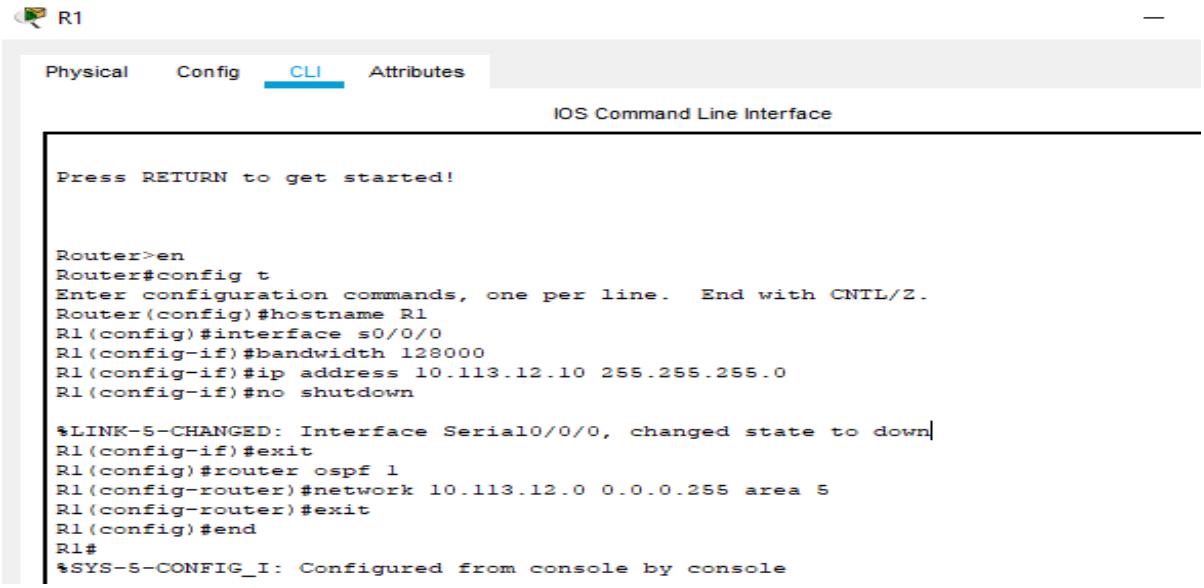
Se procede a configurar cada uno de los enrutadores. 1, 2, 3, 4, y 5
Se asignan nombre y protocolos de comunicación mediante EIGRP que fueron asignados.

Descripción del código y pantallazo de configuración en **"R1"**
Configuración Router R1

Router>en *//ingreso al modo privilegiado*
Router#config t *// ingreso al modo configuración*
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1 *//Asigno nombre al router*
R1(config)#interface s0/0/0 *//configuro interfaz del puerto serial*
R1(config-if)#bandwidth 128000 *//configuro el ancho de banda*
R1(config-if)#ip address 10.113.12.10 255.255.255.0 *//asigno la direccion IP*
R1(config-if)#no shutdown *//Mantener encendido el router*

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#exit
R1(config)#router ospf 1 *//configura el protocolo ospf*
R1(config-router)#network 10.113.12.0 0.0.0.255 area 5 *//asigno red y numero de área*
R1(config-router)#exit *//salir del modo configuración*
R1(config)#end *//finalizar*
R1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 3. Aplicando código R1

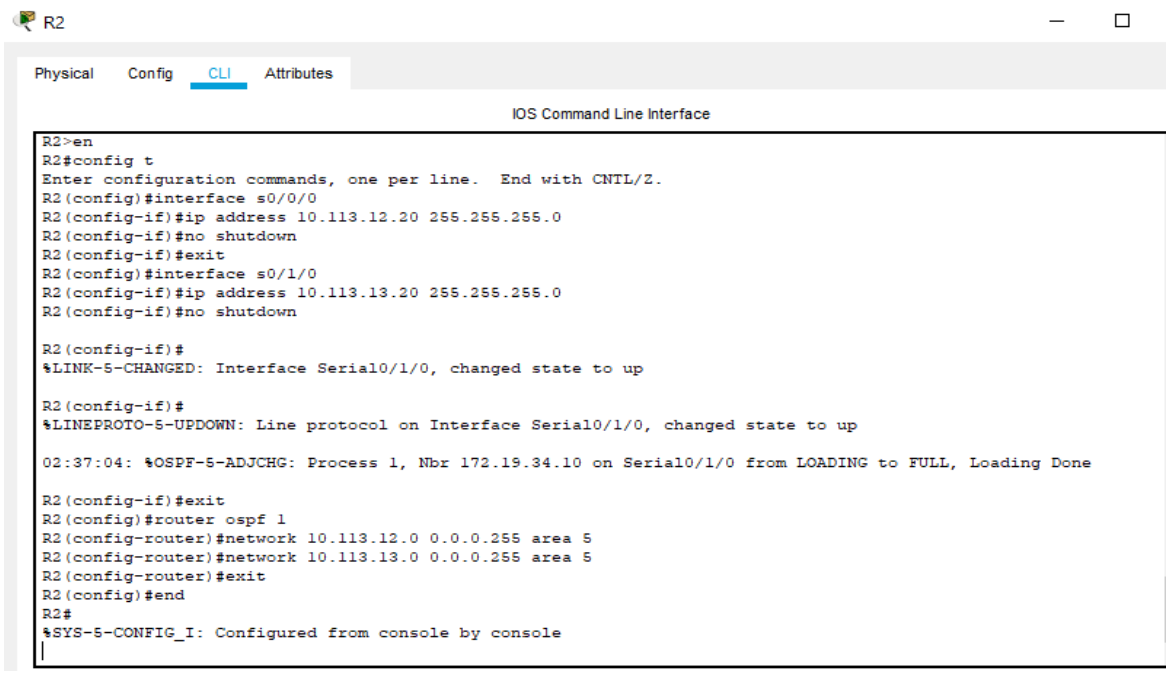


Descripción del código y pantallazo de configuración en **"R2"**
Configuración Router R2

Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface s0/0/0
R2(config-if)#ip address 10.113.12.20 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface s0/1/0
R2(config-if)#ip address 10.113.13.20 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
R2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

02:37:04: %OSPF-5-ADJCHG: Process 1, Nbr 172.19.34.10 on Serial0/1/0 from LOADING to FULL, Loading Done
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R2(config-if)#exit
R2(config)#router ospf 1
R2(config-router)#network 10.113.12.0 0.0.0.255 area 5
R2(config-router)#
00:50:35: %OSPF-5-ADJCHG: Process 1, Nbr 10.113.12.10 on Serial0/0/0 from LOADING to FULL, Loading Done
R2(config-router)#network 10.113.13.0 0.0.0.255 area 5
R2(config-router)#exit
R2(config)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 4. Aplicando código R2

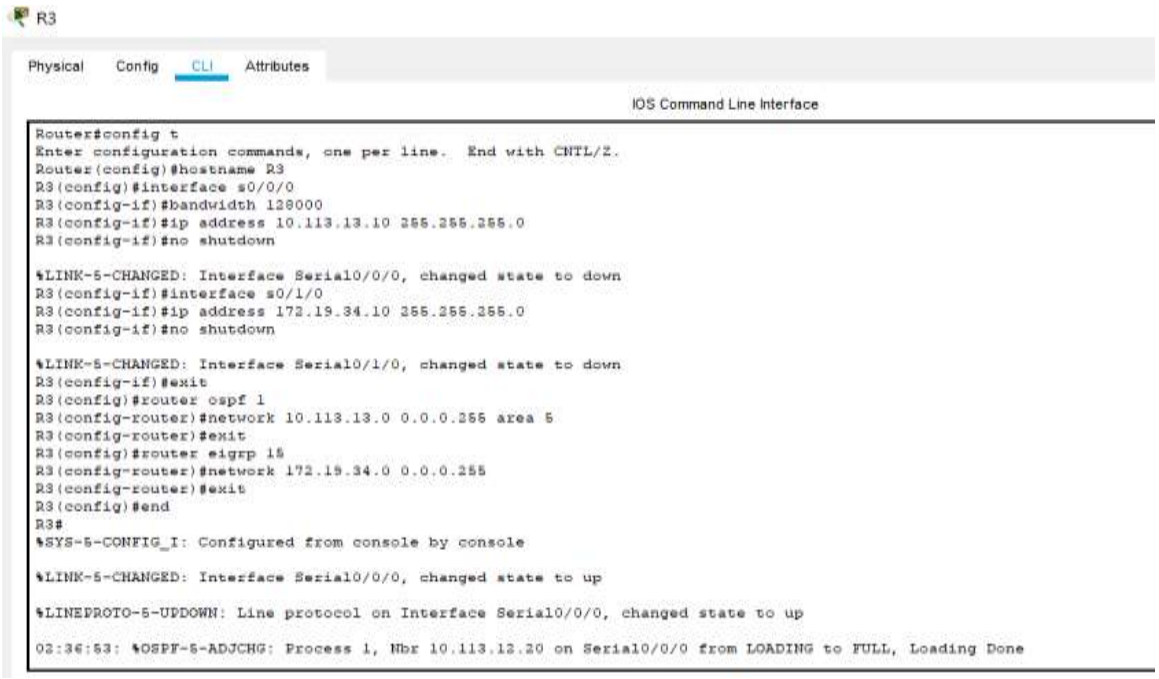


Descripción del código y pantallazo de configuración en **"R3"**
Configuración Router R3

Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#interface s0/0/0

```
R3(config-if)#bandwidth 128000
R3(config-if)#ip address 10.113.13.10 255.255.255.0
R3(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R3(config-if)#interface s0/1/0
R3(config-if)#ip address 172.19.34.10 255.255.255.0
R3(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R3(config-if)#exit
R3(config)#router ospf 1
R3(config-router)#network 10.113.13.0 0.0.0.255 area 5
R3(config-router)#exit
R3(config)#router eigrp 15
R3(config-router)#network 172.19.34.0 0.0.0.255
R3(config-router)#exit
R3(config)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console
%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
02:36:53: %OSPF-5-ADJCHG: Process 1, Nbr 10.113.12.20 on Serial0/0/0 from
LOADING to FULL, Loading Done
```

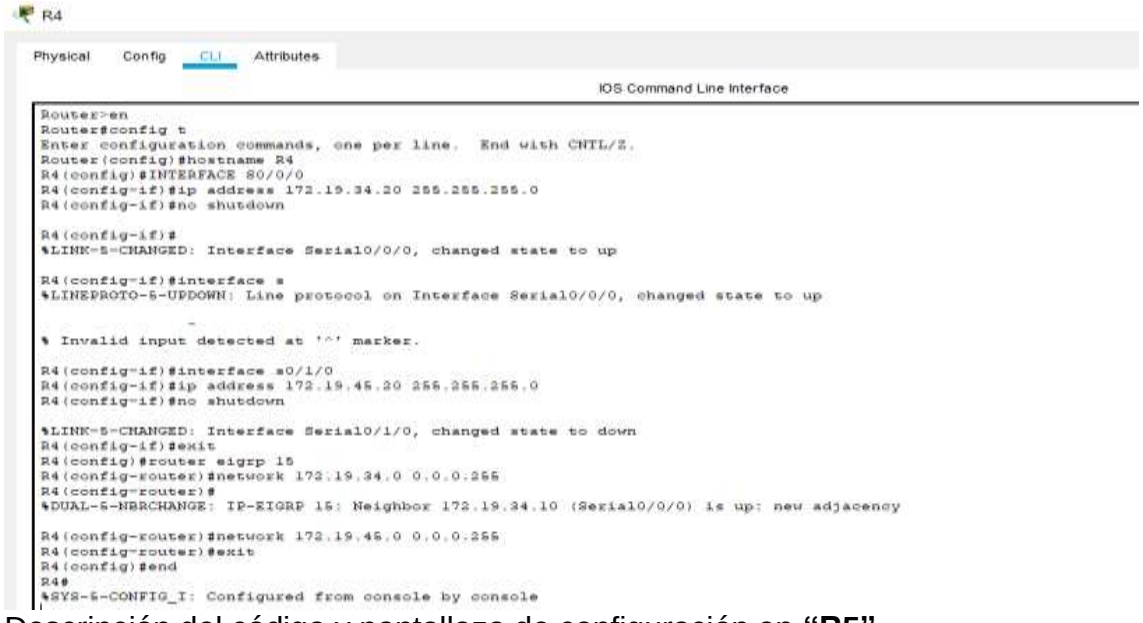
Figura 5. Aplicando código R3



Descripción del código y pantallazo de configuración en **“R4”**
Configuración Router R4

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R4
R4(config)#INTERFACE S0/0/0
R4(config-if)#ip address 172.19.34.20 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R4(config-if)#interface s0/1/0
R4(config-if)#ip address 172.19.45.20 255.255.255.0
R4(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R4(config-if)#exit
R4(config)#router eigrp 15
R4(config-router)#network 172.19.34.0 0.0.0.255
R4(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 15: Neighbor 172.19.34.10 (Serial0/0/0) is up: new
adjacency
R4(config-router)#network 172.19.45.0 0.0.0.255
R4(config-router)#exit
R4(config)#end
R4#
%SYS-5-CONFIG_I: Configured from console by console
```

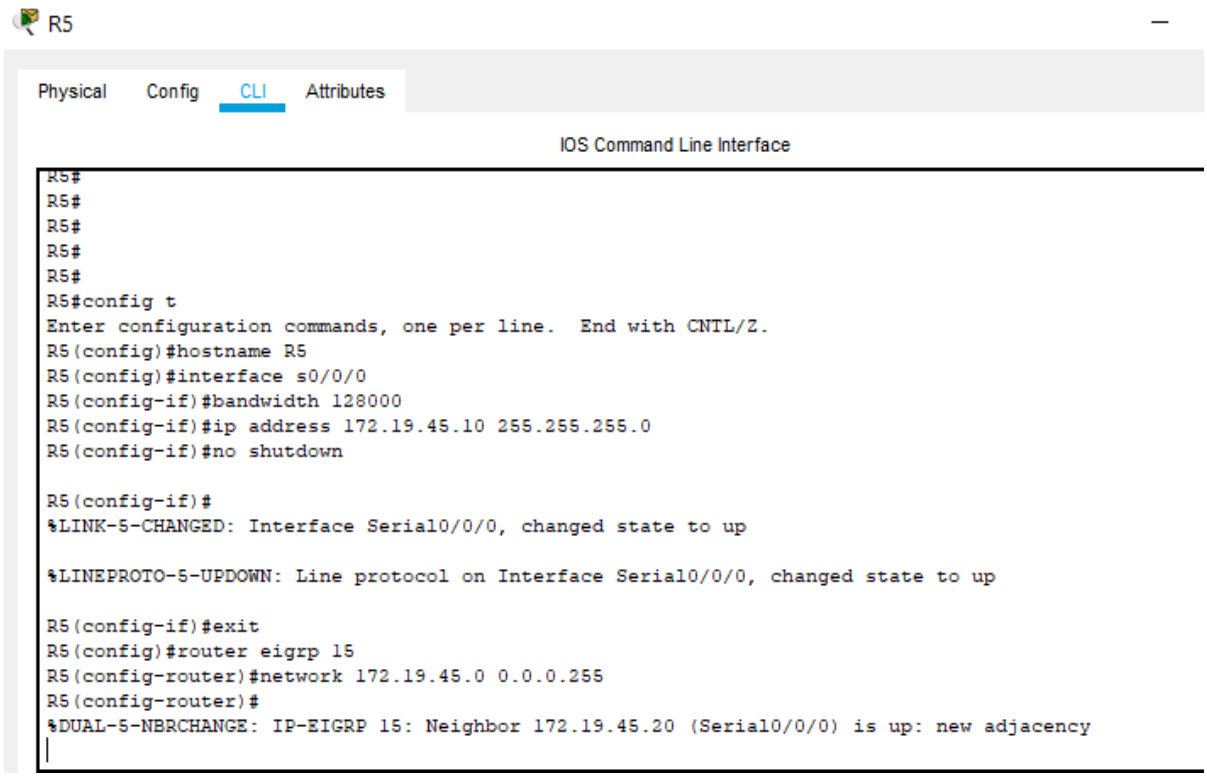
Figura 6. Aplicando código R4



Descripción del código y pantallazo de configuración en **“R5”**
Configuración Router R5

Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R5
R5(config)#interface s0/0/0
R5(config-if)#bandwidth 128000
R5(config-if)#ip address 172.19.45.10 255.255.255.0
R5(config-if)#no shutdown
R5(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R5(config-if)#exit
R5(config)#router eigrp 15
R5(config-router)#network 172.19.45.0 0.0.0.255
R5(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 15: Neighbor 172.19.45.20 (Serial0/0/0) is up: new adjacency

Figura 7. Aplicando código R5



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 5 de OSPF.

Solución punto 2

Tabla 1. Interfaces loopback para crear R1

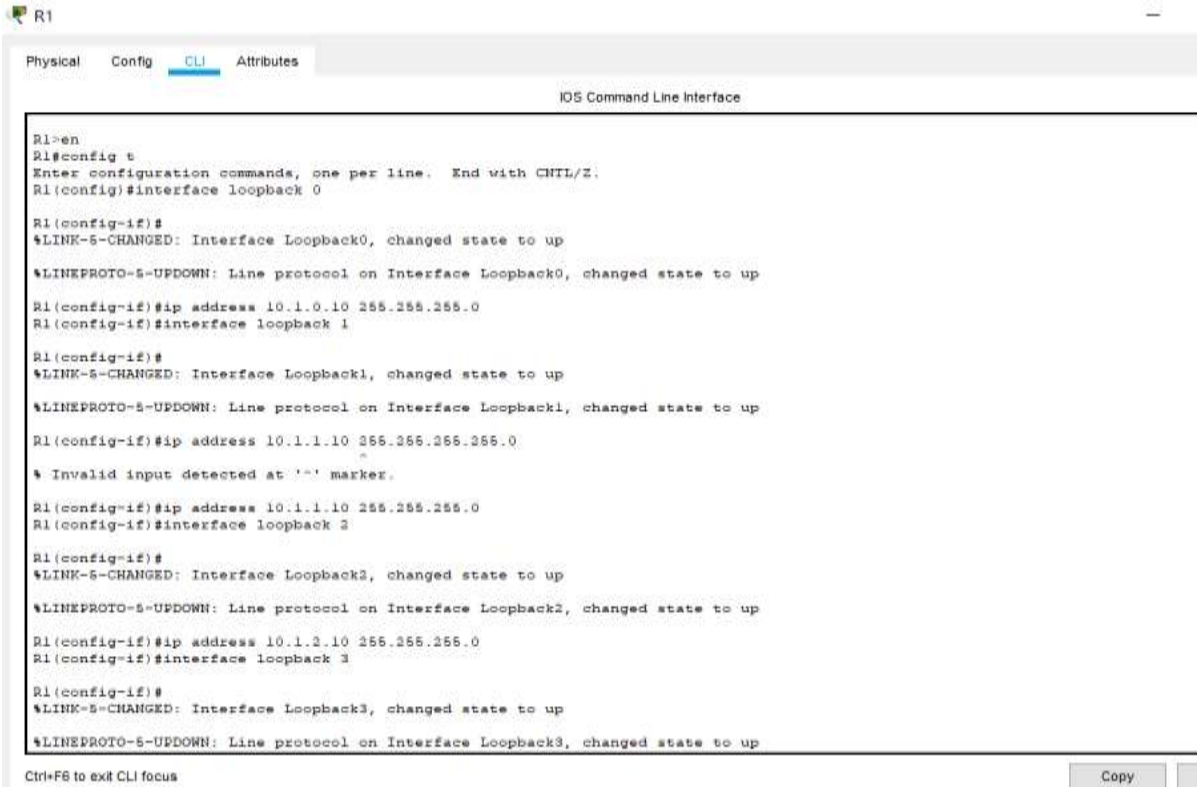
	IP:10.1.0.0	
Network	**Rangos Hosts**	**Broadcast**
10.1.0.0/24	10.1.0.1-10.1.0.254	10.1.0.255
10.1.1.0/24	10.1.1.1-10.1.1.254	10.1.1.255
10.1.2.0/24	10.1.2.1-10.1.2.254	10.1.2.255
10.1.3.0/24	10.1.3.1-10.1.3.254	10.1.3.255

Descripción del código y pantallazo de configuración interfaces Loopback en **"R1"**
Interfaces de Loopback en R1

```
R1#config t                 //Ingreso al modo configuración
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface loopback 0        //ingreso al 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 address 10.1.0.10 255.255.255.0       //asigno la direccion IP
R1(config-if)#interface loopback 1 //ingreso al 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 address 10.1.1.10 255.255.255.0  //asigno la direccion IP
R1(config-if)#interface loopback 2 //ingreso al interface Loopback 2
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback2, changed state to up
R1(config-if)#ip address 10.1.2.10 255.255.255.0 //asigno la direccion IP
R1(config-if)#interface loopback 3 //ingreso al interface Loopback 3
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback3, changed state to up
R1(config-if)#ip address 10.1.3.10 255.255.255.0 //asigno la direccion IP
R1(config-if)#exit
R1(config)#router ospf 1 //configuro el protocolo ospf
R1(config-router)#network 10.1.0.0 0.0.0.255 area 5 //asigno # de red y numero de área 5
R1(config-router)#network 10.1.1.0 0.0.0.255 area 5 //asigno # de red y numero de área 5
R1(config-router)#network 10.1.2.0 0.0.0.255 area 5 //asigno # de red y numero de área 5
R1(config-router)#network 10.1.3.0 0.0.0.255 area 5 //asigno # de red y numero de área 5
R1(config-router)#exit //salgo del modo configuración
```

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

Figura 8. Interfaces de Loopback en R1



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 15.

Solución punto 3

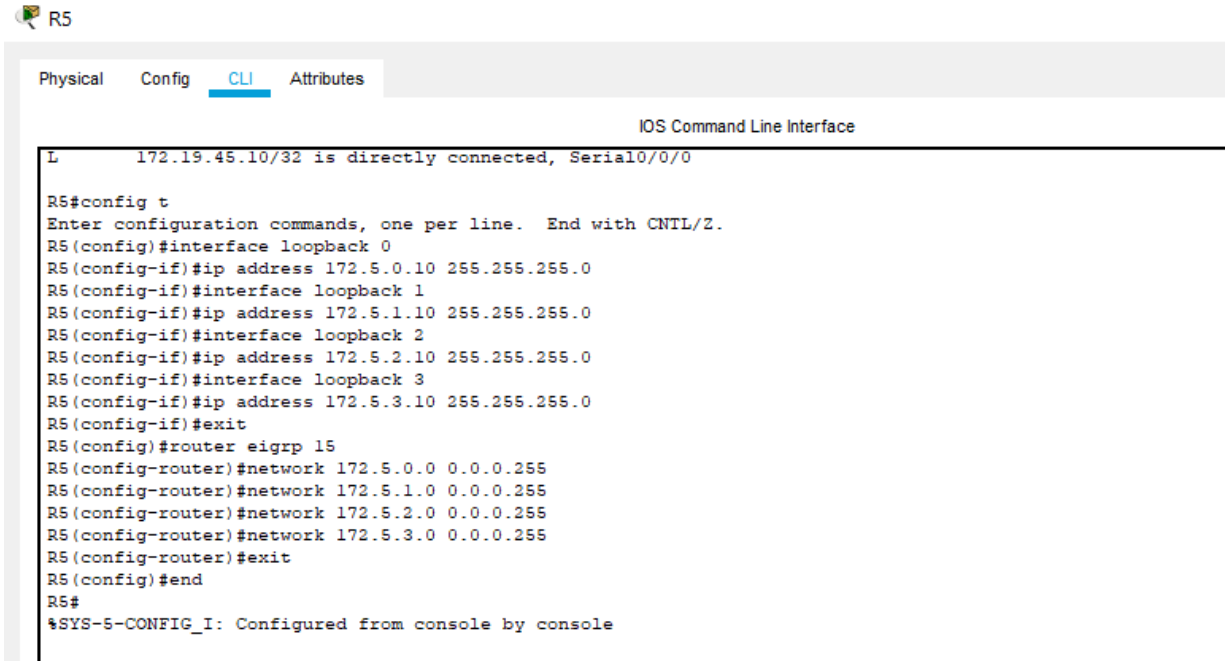
Tabla 2. Interfaces loopback para crear R5

	IP:172.5.0.0	
Network	**Rangos Hosts**	**Broadcast**
172.5.0.0/24	172.5.0.1-172.5.0.254	172.5.0.255
172.5.1.0/24	172.5.1.1-172.5.1.254	172.5.1.255
172.5.2.0/24	172.5.2.1-172.5.2.254	172.5.2.255
172.5.3.0/24	172.5.3.1-172.5.3.254	172.5.3.255

Descripción del código y pantallazo de configuración interfaces Loopback en **"R5"**
Interfaces de Loopback en R5

R5>en *//ingreso al modo privilegiado*
R5#config t *//Ingreso al modo de configuración*
Enter configuration commands, one per line. End with CNTL/Z.
R5(config)#interface loopback 0 *//ingreso al interface Loopback 0*
R5(config-if)#ip address 172.5.0.10 255.255.255.0 *//asigno la dirección IP de loopback 0*
R5(config-if)#interface loopback 1 *// ingreso al interface Loopback 1*
R5(config-if)#ip address 172.5.1.10 255.255.255.0 *//asigno la dirección IP de loopback 1*
R5(config-if)#interface loopback 2 *//ingreso al interface Loopback 2*
R5(config-if)#ip address 172.5.2.10 255.255.255.0 *//asigno la dirección IP de loopback 2*
R5(config-if)#interface loopback 3 *//ingreso al interface Loopback 3*
R5(config-if)#ip address 172.5.3.10 255.255.255.0 *//asigno la dirección IP de loopback 3*
R5(config-if)#exit *//salgo del modo configuración del loopback*
R5(config)#router eigrp 15 *//ingreso al modo configuración EIGRP 15*
R5(config-router)#network 172.5.0.0 0.0.0.255 *//ingreso el # de la red*
R5(config-router)#network 172.5.1.0 0.0.0.255 *//ingreso el # de la red*
R5(config-router)#network 172.5.2.0 0.0.0.255 *//ingreso el # de la red*
R5(config-router)#network 172.5.3.0 0.0.0.255 *//ingreso el # de la red*
R5(config-router)#exit *//salgo del modo configuración de red*
R5(config)#end *//finalizar configuración*
R5#
%SYS-5-CONFIG_I: Configured from console by console

Figura 9. Interfaces de Loopback en R5



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**.

Solución punto 4

Descripción del código y pantallazo de verificación interfaces Loopback en **"R3"**
Verificación Interfaces Loopback en R3

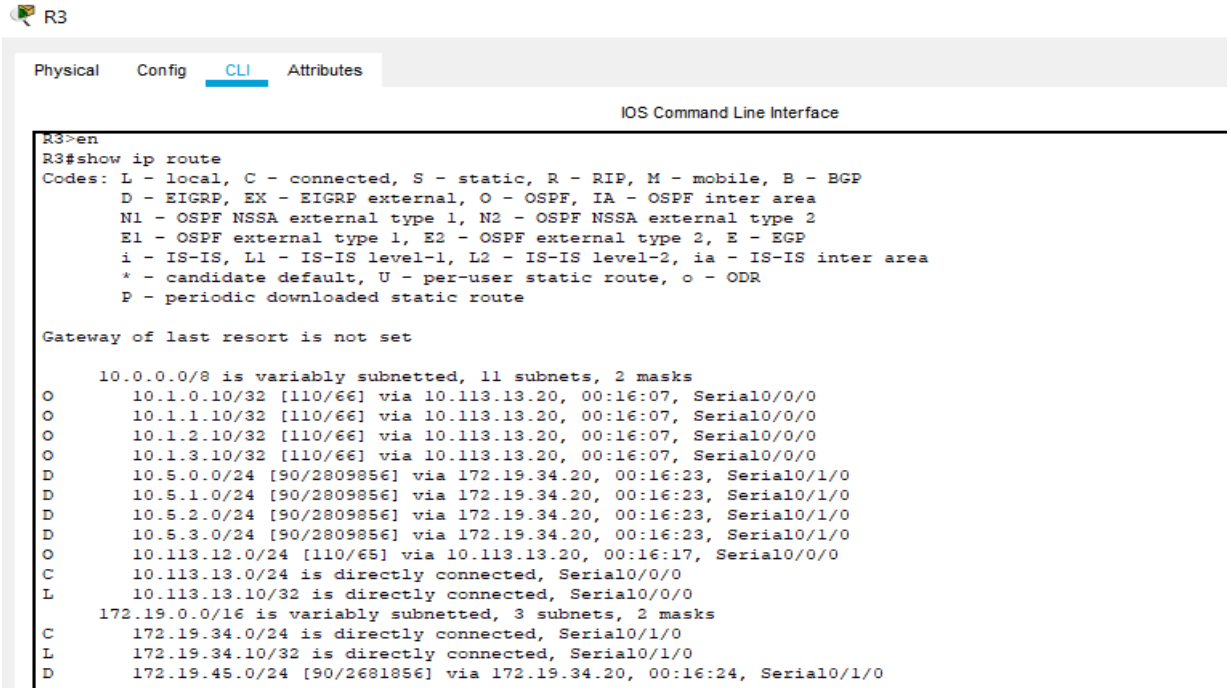
R3>en //*ingreso al modo privilegiado*
R3#show ip route //*comando de verificar tabla de enrutamiento*
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 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
O 10.1.0.10/32 [110/66] via 10.113.13.20, 00:16:07, Serial0/0/0
O 10.1.1.10/32 [110/66] via 10.113.13.20, 00:16:07, Serial0/0/0
O 10.1.2.10/32 [110/66] via 10.113.13.20, 00:16:07, Serial0/0/0
O 10.1.3.10/32 [110/66] via 10.113.13.20, 00:16:07, Serial0/0/0
D 10.5.0.0/24 [90/2809856] via 172.19.34.20, 00:16:23, Serial0/1/0
D 10.5.1.0/24 [90/2809856] via 172.19.34.20, 00:16:23, Serial0/1/0
D 10.5.2.0/24 [90/2809856] via 172.19.34.20, 00:16:23, Serial0/1/0
D 10.5.3.0/24 [90/2809856] via 172.19.34.20, 00:16:23, Serial0/1/0
O 10.113.12.0/24 [110/65] via 10.113.13.20, 00:16:17, Serial0/0/0
C 10.113.13.0/24 is directly connected, Serial0/0/0
L 10.113.13.10/32 is directly connected, Serial0/0/0
172.19.0.0/16 is variably subnetted, 3 subnets, 2 masks
C 172.19.34.0/24 is directly connected, Serial0/1/0
L 172.19.34.10/32 is directly connected, Serial0/1/0
D 172.19.45.0/24 [90/2681856] via 172.19.34.20, 00:16:24, Serial0/1/0

Nota:
Como se evidencia en el resultado R3 aprendió las interfaces Loopback de R1 y R5.

Figura 10. Verificación Interfaces de Loopback en R3



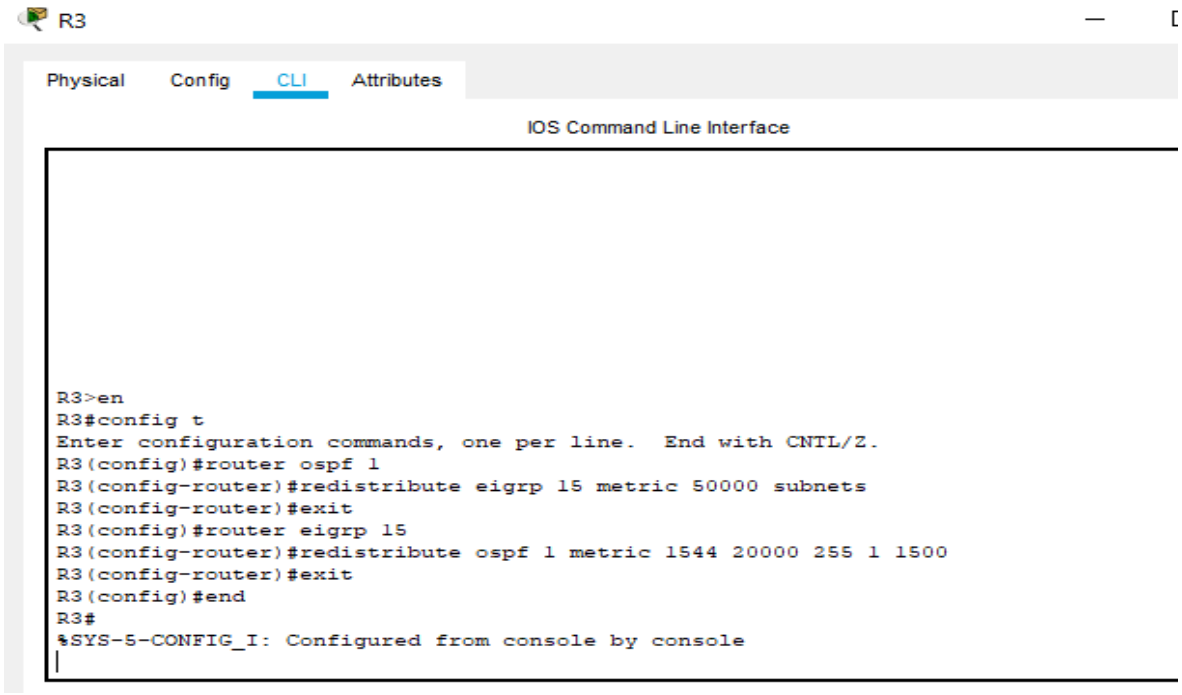
5. Configure R3 para redistribuir las rutas EIGRP en OSPF usando el costo de 50000 y luego redistribuya las rutas OSPF en EIGRP usando un ancho de banda T1 y 20,000 microsegundos de retardo.

Solución punto 5

Descripción del código y pantallazo de configuración redistribución rutas EIGRP en OSPF y viceversa en **"R3"**
Redistribución rutas EIGRP en OSPF y OSPF en EIGRP con su "BW" en R3

R3>en //*ingreso al modo privilegiado*
R3#config t //*ingreso al modo configuración del router*
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1 //*ingreso a configurar el protocolo ospf*
R3(config-router)#redistribute eigrp 15 metric 50000 subnets //*redistribuyo la ruta EIGRP usando el valor de 50000*
R3(config-router)#exit //*salgo del modo configuración de ruta EIGRP*
R3(config)#router eigrp 15 //*ingreso al modo de configurar protocolo EIGRP 15*
R3(config-router)#redistribute ospf 1 metric 1544 20000 255 1 1500 //*Redistribuyo las rutas OSPF usando un ancho de banda de 20000 microsegundos de retardo*
R3(config-router)#exit //*Salgo del modo configuración de ruta OSPF*
R3(config)#end //*finalizo configuración del router*
R3#
%SYS-5-CONFIG_I: Configured from console by console

Figura 11. Redistribución Rutas EIGRP en OSPF



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.**

Solución punto 6

Descripción del código y pantallazo de verificación de las rutas del sistema autónomo opuesto en **"R1 y R5"**
Verificación de las rutas del sistema autónomo opuesto en **"R1"**

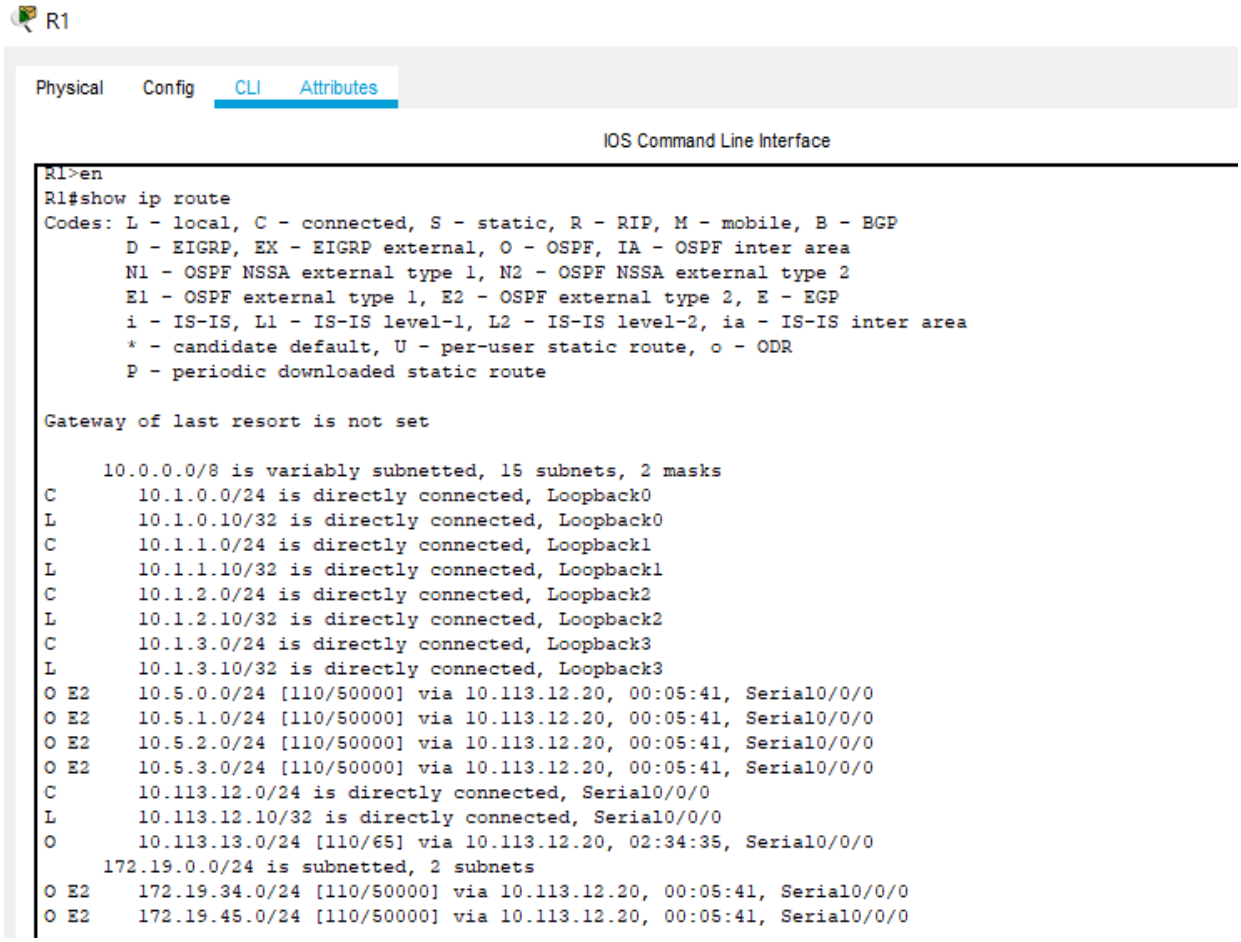
R1>en *//ingreso al modo privilegiado*
R1#show ip route *//comando de verificar la tabla de enrutamiento de router*
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external 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, 15 subnets, 2 masks

C 10.1.0.0/24 is directly connected, Loopback0
L 10.1.0.10/32 is directly connected, Loopback0
C 10.1.1.0/24 is directly connected, Loopback1
L 10.1.1.10/32 is directly connected, Loopback1
C 10.1.2.0/24 is directly connected, Loopback2
L 10.1.2.10/32 is directly connected, Loopback2
C 10.1.3.0/24 is directly connected, Loopback3
L 10.1.3.10/32 is directly connected, Loopback3
O E2 10.5.0.0/24 [110/50000] via 10.113.12.20, 00:05:41, Serial0/0/0
O E2 10.5.1.0/24 [110/50000] via 10.113.12.20, 00:05:41, Serial0/0/0
O E2 10.5.2.0/24 [110/50000] via 10.113.12.20, 00:05:41, Serial0/0/0
O E2 10.5.3.0/24 [110/50000] via 10.113.12.20, 00:05:41, Serial0/0/0
C 10.113.12.0/24 is directly connected, Serial0/0/0
L 10.113.12.10/32 is directly connected, Serial0/0/0
O 10.113.13.0/24 [110/65] via 10.113.12.20, 02:34:35, Serial0/0/0
172.19.0.0/24 is subnetted, 2 subnets
O E2 172.19.34.0/24 [110/50000] via 10.113.12.20, 00:05:41, Serial0/0/0
O E2 172.19.45.0/24 [110/50000] via 10.113.12.20, 00:05:41, Serial0/0/0

Figura 12. Rutas del sistema autónomo Opuesto en R1

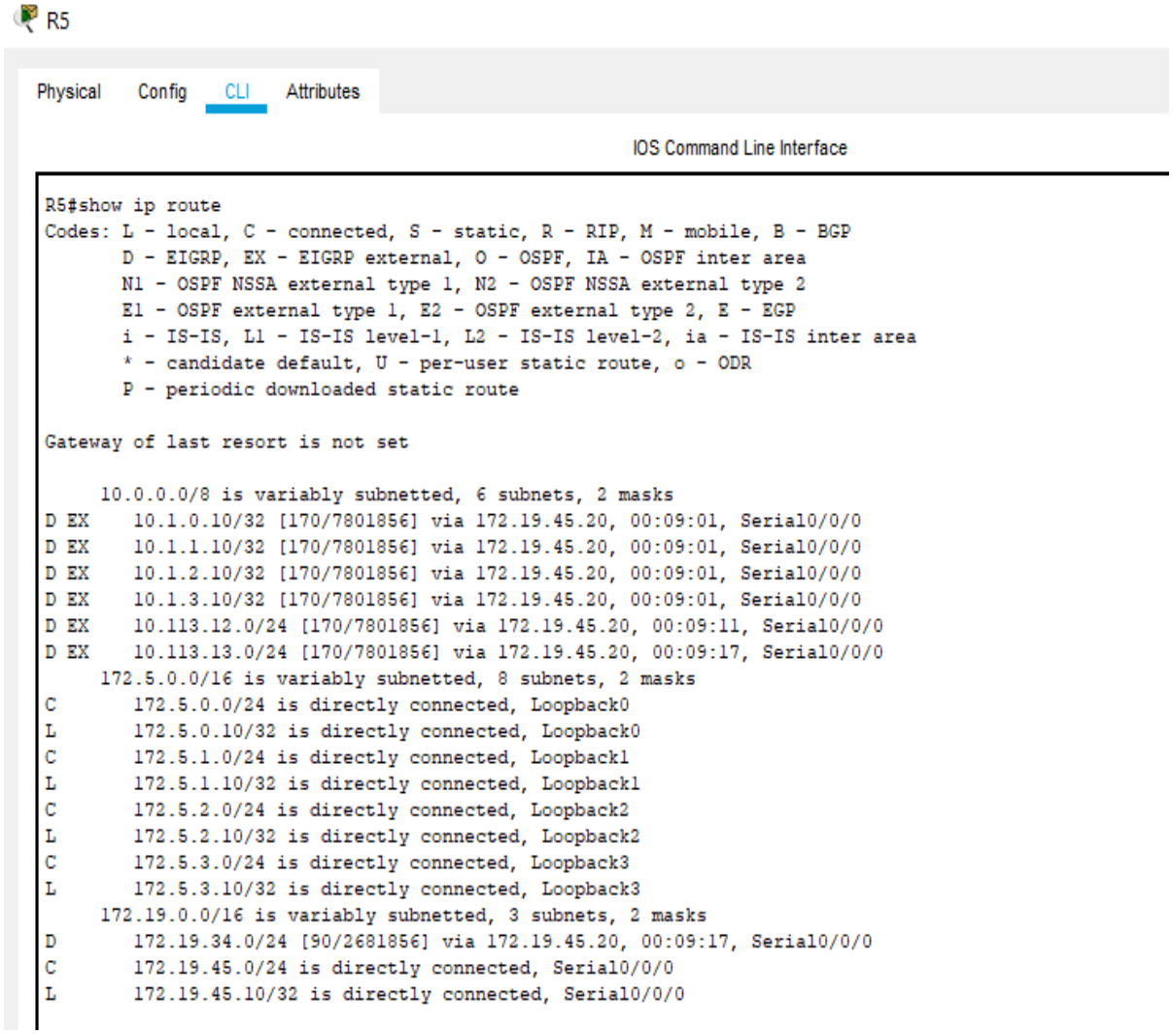


Verificación de las rutas del sistema autónomo opuesto en **“R5”**

R5>en //*ingreso al modo privilegiado*
R5#show ip route //*comando de verificar tabla de enrutamiento del router*
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
D EX 10.1.0.10/32 [170/7801856] via 172.19.45.20, 00:09:01, Serial0/0/0
D EX 10.1.1.10/32 [170/7801856] via 172.19.45.20, 00:09:01, Serial0/0/0
D EX 10.1.2.10/32 [170/7801856] via 172.19.45.20, 00:09:01, Serial0/0/0
D EX 10.1.3.10/32 [170/7801856] via 172.19.45.20, 00:09:01, Serial0/0/0
D EX 10.113.12.0/24 [170/7801856] via 172.19.45.20, 00:09:11, Serial0/0/0
D EX 10.113.13.0/24 [170/7801856] via 172.19.45.20, 00:09:17, Serial0/0/0
172.5.0.0/16 is variably subnetted, 8 subnets, 2 masks
C 172.5.0.0/24 is directly connected, Loopback0
L 172.5.0.10/32 is directly connected, Loopback0
C 172.5.1.0/24 is directly connected, Loopback1
L 172.5.1.10/32 is directly connected, Loopback1
C 172.5.2.0/24 is directly connected, Loopback2
L 172.5.2.10/32 is directly connected, Loopback2
C 172.5.3.0/24 is directly connected, Loopback3
L 172.5.3.10/32 is directly connected, Loopback3
172.19.0.0/16 is variably subnetted, 3 subnets, 2 masks
D 172.19.34.0/24 [90/2681856] via 172.19.45.20, 00:09:17, Serial0/0/0
C 172.19.45.0/24 is directly connected, Serial0/0/0
L 172.19.45.10/32 is directly connected, Serial0/0/0

Figura 13. Rutas del sistema autónomo Opuesto en R5

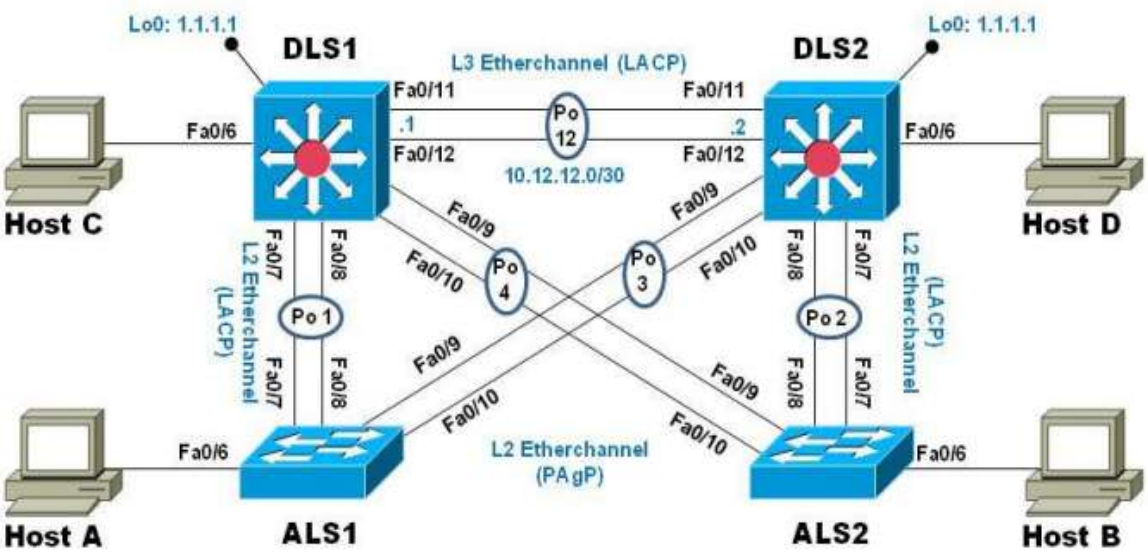


NOTA:
Como se puede evidenciar las rutas del sistema autónomo opuesto existen en su tabla de enrutamiento en R1 y R5.

2. ESCENARIO 2

Mediante la implementación de comandos IOS de configuración avanzada en routers (con direccionamiento IPv4) se analizan los enlaces de protocolos de enrutamiento como: RIPng, OSPFv3, EIGRP y BGP, realizando el diseño de las redes escalables mediante la utilización de enrutamientos como se describe en los ítem solicitados en la actividad consiguiendo la conexión esperada en el planteamiento como se evidencia en cada uno de los pasos realizados.

Topología de red



Parte 1: Configurar la red de acuerdo con las especificaciones.

a. Apagar todas las interfaces en cada switch.

Apagado Interfaces SWITCH DLS1

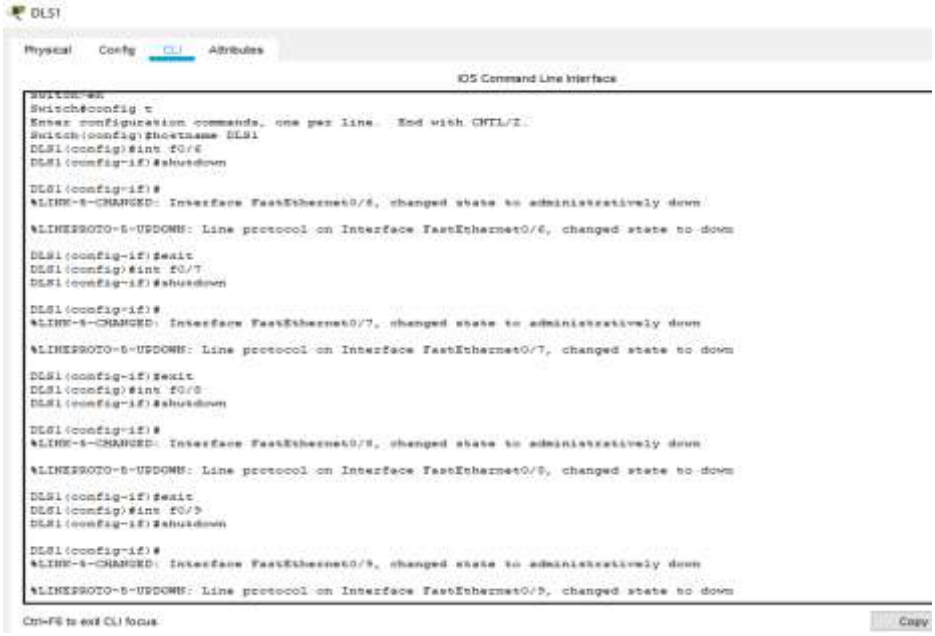
```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS1
DLS1(config)#int f0/6
DLS1(config-if)#shutdown
DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down

DLS1(config-if)#exit
DLS1(config)#int f0/7
DLS1(config-if)#shutdown
DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
DLS1(config-if)#exit
DLS1(config)#int f0/8
DLS1(config-if)#shutdown
DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
DLS1(config-if)#exit
DLS1(config)#int f0/9
DLS1(config-if)#shutdown
DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
DLS1(config-if)#exit
DLS1(config)#int f0/10
DLS1(config-if)#shutdown
DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
DLS1(config-if)#exit
DLS1(config)#int f0/11
DLS1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
DLS1(config-if)#exit
DLS1(config)#int f0/12
DLS1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down

DLS1(config-if)#exit
DLS1(config)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 14. Apagado interfaces de switch DLS1

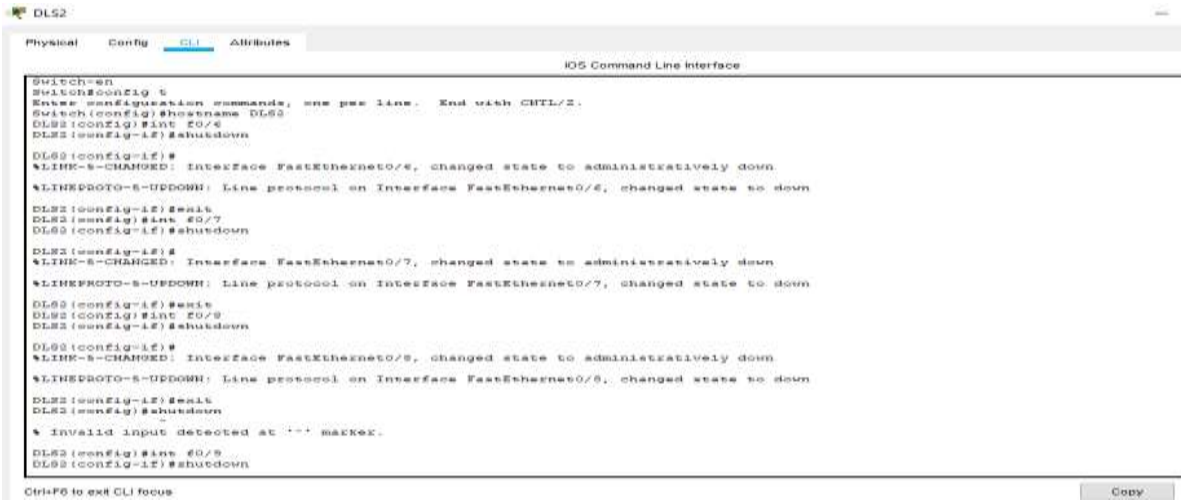


Apagado Interfaces SWITCH DLS2

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS2
DLS2(config)#int f0/6
DLS2(config-if)#shutdown
DLS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down
DLS2(config-if)#exit
DLS2(config)#int f0/7
DLS2(config-if)#shutdown
DLS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
DLS2(config-if)#exit

```
DLS2(config)#int f0/8
DLS2(config-if)#shutdown
DLS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to
down
DLS2(config-if)#exit
DLS2(config)#shutdown
DLS2(config)#int f0/9
DLS2(config-if)#shutdown
DLS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to
down
DLS2(config-if)#exit
DLS2(config)#int f0/10
DLS2(config-if)#shutdown
DLS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to
down
DLS2(config-if)#exit
DLS2(config)#int f0/11
DLS2(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down
DLS2(config-if)#exit
DLS2(config)#int f0/12
DLS2(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down
DLS2(config-if)#exit
DLS2(config)#
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
```

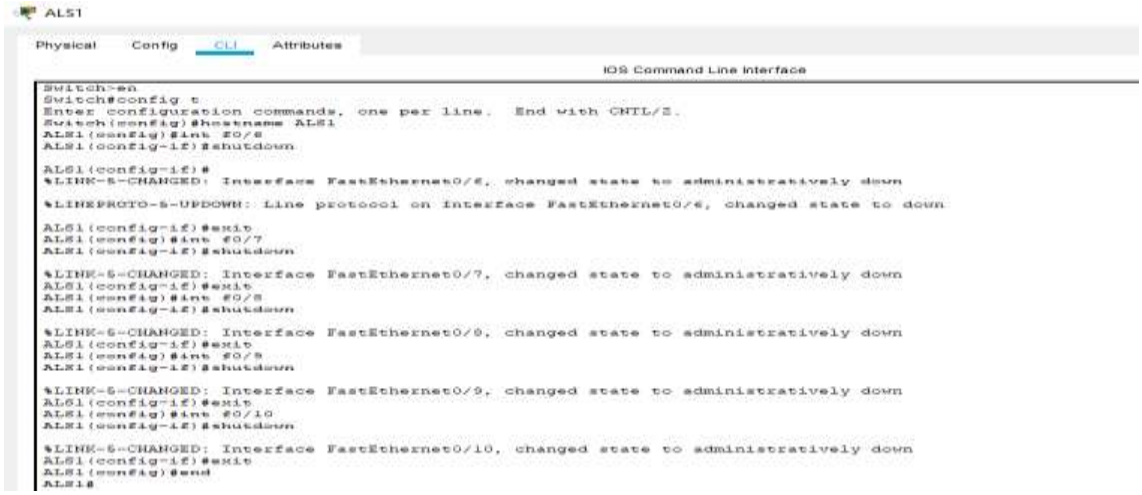
Figura 15. Apagado interfaces de switch DLS2



Apagado Interfaces SWITCH ALS1

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname ALS1
ALS1(config)#int f0/6
ALS1(config-if)#shutdown
ALS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down
ALS1(config-if)#exit
ALS1(config)#int f0/7
ALS1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
ALS1(config-if)#exit
ALS1(config)#int f0/8
ALS1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
ALS1(config-if)#exit
ALS1(config)#int f0/9
ALS1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
ALS1(config-if)#exit
ALS1(config)#int f0/10
ALS1(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
ALS1(config-if)#exit
ALS1(config)#end
ALS1#

Figura 16. Apagado interfaces de switch ALS1



Apagado Interfaces SWITCH ALS2

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#hostname ALS2
ALS2(config)#INT F0/6
ALS2(config-if)#shutdown
ALS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down
ALS2(config-if)#exit
ALS2(config)#int f0/7
ALS2(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down
ALS2(config-if)#exit
ALS2(config)#int f0/8
ALS2(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down
ALS2(config-if)#exit
ALS2(config)#int f0/9
ALS2(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down
ALS2(config-if)#exit
ALS2(config)#int f0/10
ALS2(config-if)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down
ALS2(config-if)#exit
ALS2(config)#end
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 17. Apagado interfaces de switch ALS2

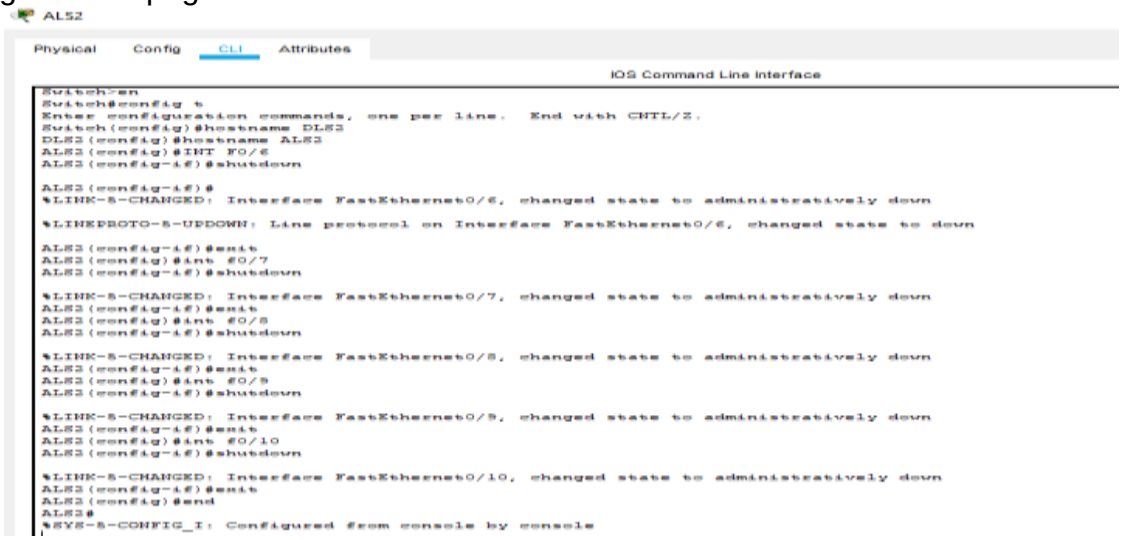
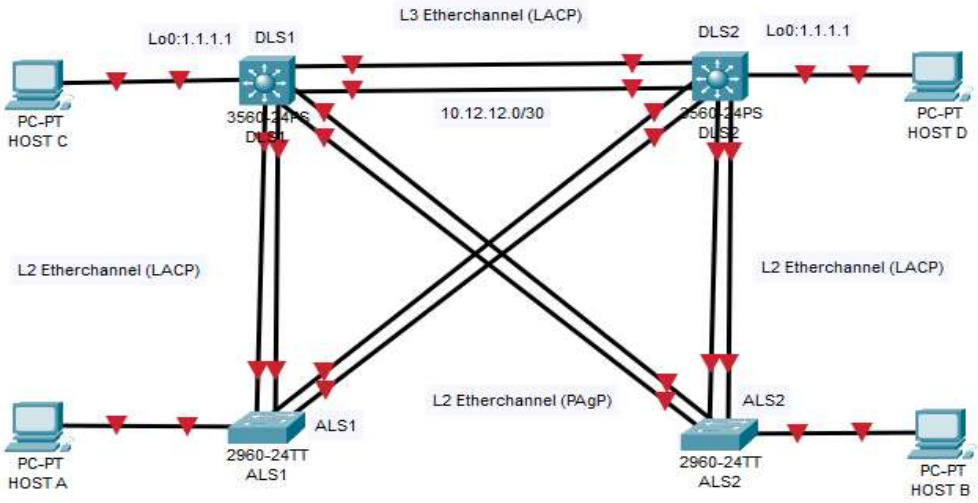


Figura 18. Apagado de todos los switches de la topologia



b. Asignar un nombre a cada switch acorde con el escenario establecido.

Para este punto el nombramiento de los switches se realizó en el paso anterior la configuración es la siguiente:

- **DLS1**

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS1

- **DLS2**

Switch>en

Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS2

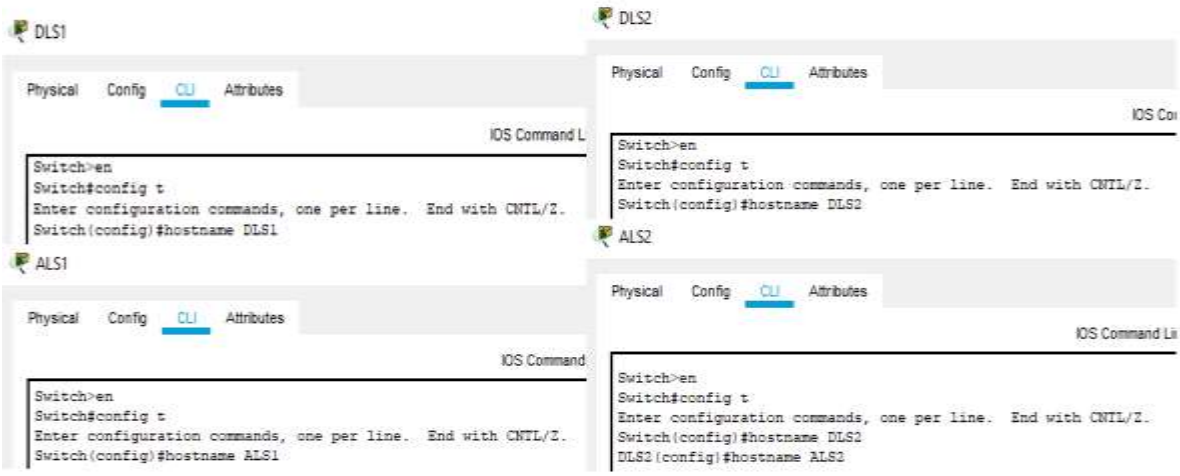
- **ALS1**

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname ALS1

- **ALS2**

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname ALS2

Figura 19. Nombramiento a cada switch de la topologia



c. Configurar los puertos troncales y Port-channels tal como se muestra en el diagrama.

1. La conexión entre DLS1 y DLS2 será un Ether-Channels capa-3 utilizando LACP. Para DLS1 se utilizará la dirección IP 10.12.12.1/30 y para DLS2 utilizará 10.12.12.2/30.

Realizamos la configuración de conexión de los switches **DLS1** y **DLS2**

- **DLS1**

DLS1#CONFIG T
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface vlan 500
DLS1(config-if)#ip address 10.12.12.1 255.255.255.252
DLS1(config-if)#interface range f0/11-12
DLS1(config-if-range)#channel-protocol lacp

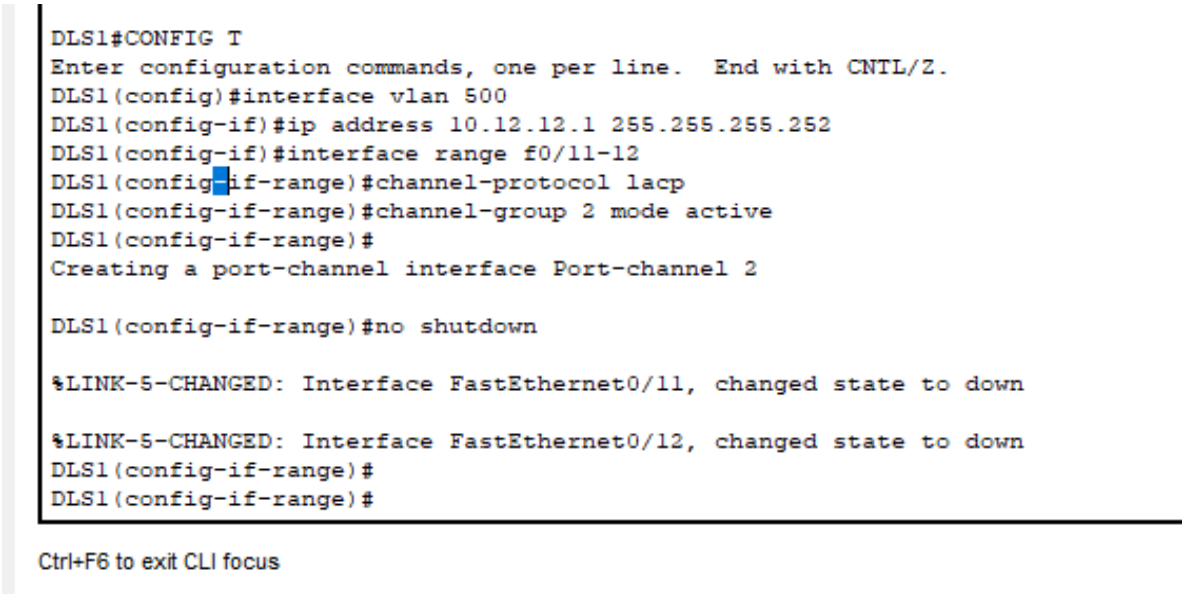
DLS1(config-if-range)#channel-group 2 mode active
DLS1(config-if-range)#
Creating a port-channel interface Port-channel 2

DLS1(config-if-range)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to down
DLS1(config-if-range)#

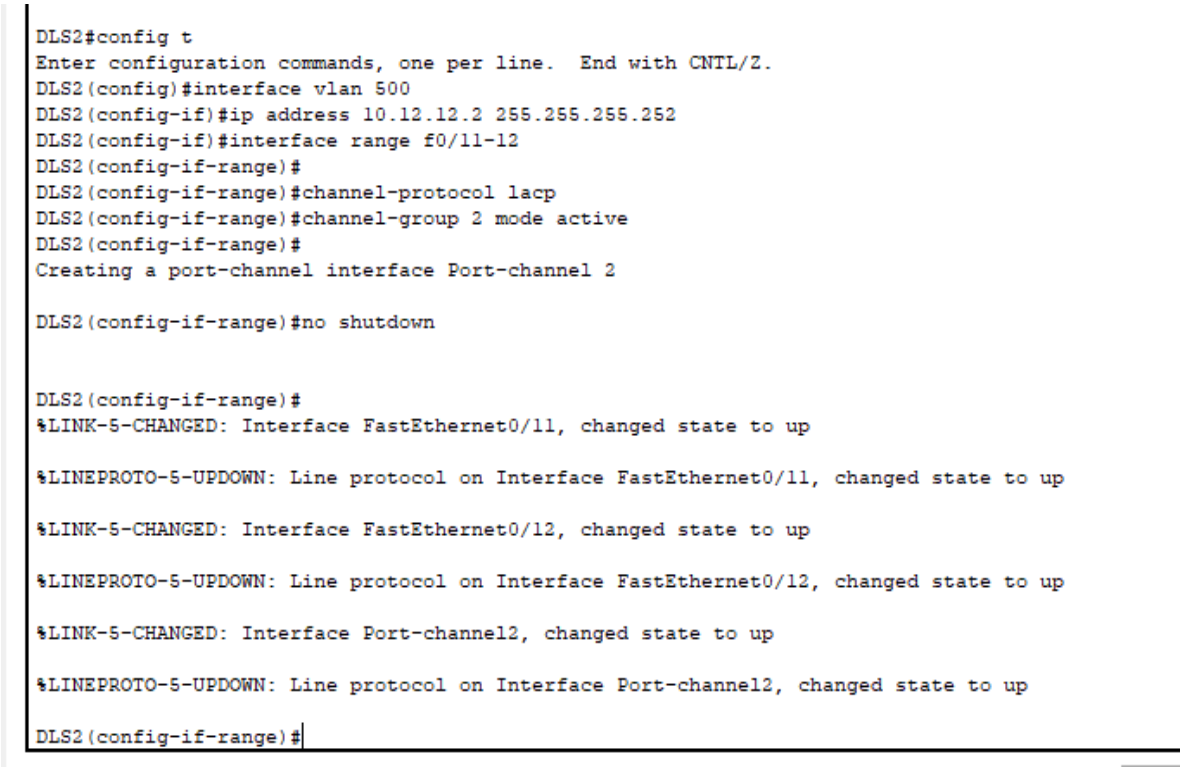
Figura 20. Configuracion conexión switch DLS1



DLS2
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface vlan 500
DLS2(config-if)#ip address 10.12.12.2 255.255.255.252
DLS2(config-if)#interface range f0/11-12
DLS2(config-if-range)#
DLS2(config-if-range)#channel-protocol lacp
DLS2(config-if-range)#channel-group 2 mode active
DLS2(config-if-range)#
Creating a port-channel interface Port-channel 2
DLS2(config-if-range)#no shutdown
DLS2(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
%LINK-5-CHANGED: Interface Port-channel2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to up
DLS2(config-if-range)#

Figura 21. Configuracion conexión switch DLS2



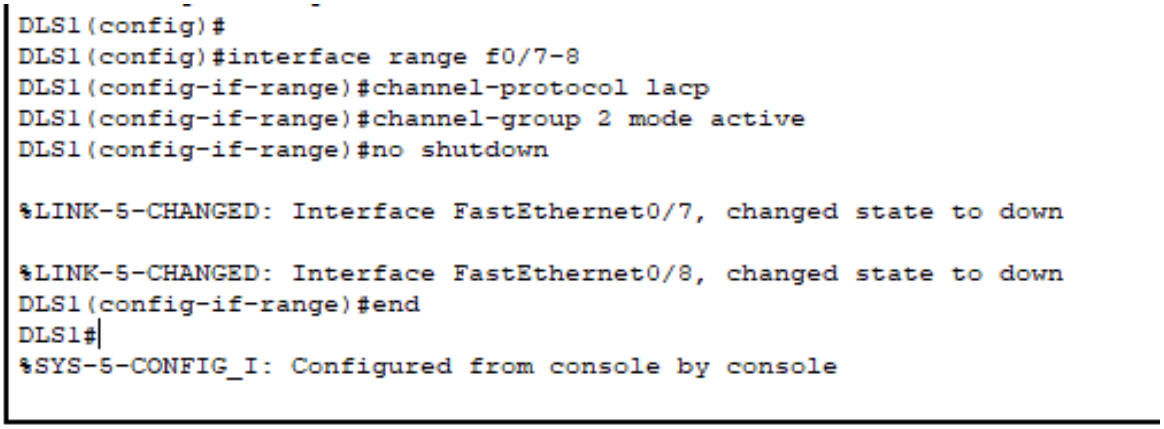
2. Los Port-channels en las interfaces Fa0/7 y Fa0/8 utilizarán LACP.

Se realiza la configuración de las interfaces Fa0/7 y Fa0/8 en DLS1 y ALS1

DLS1
DLS1>en
DLS1(config)#
DLS1(config)#interface range f0/7-8
DLS1(config-if-range)#channel-protocol lacp
DLS1(config-if-range)#channel-group 2 mode active
DLS1(config-if-range)#no shutdown
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down

DLS1(config-if-range)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

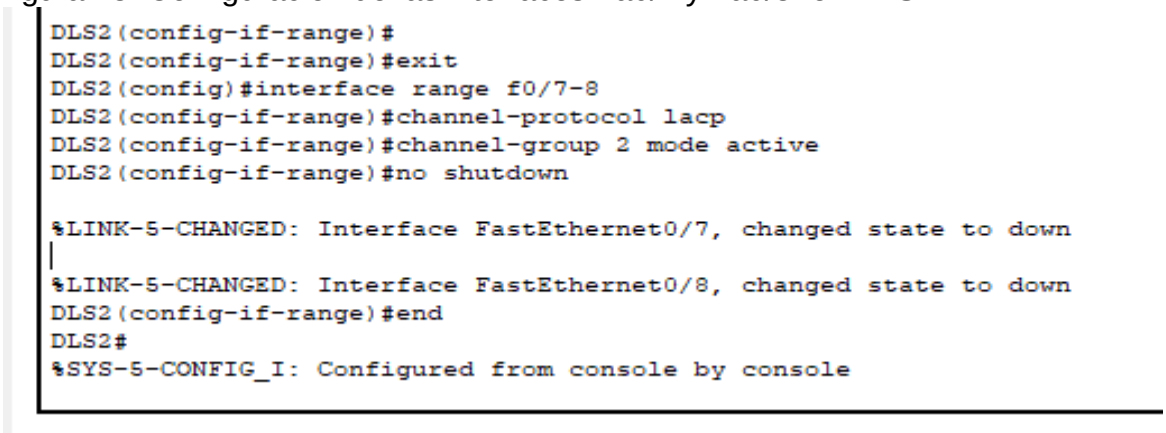
Figura 22. Configuración de las interfaces Fa0/7 y Fa0/8 en DLS1



DLS2

DLS2(config-if-range)#
DLS2(config-if-range)#exit
DLS2(config)#interface range f0/7-8
DLS2(config-if-range)#channel-protocol lacp
DLS2(config-if-range)#channel-group 2 mode active
DLS2(config-if-range)#no shutdown
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
DLS2(config-if-range)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

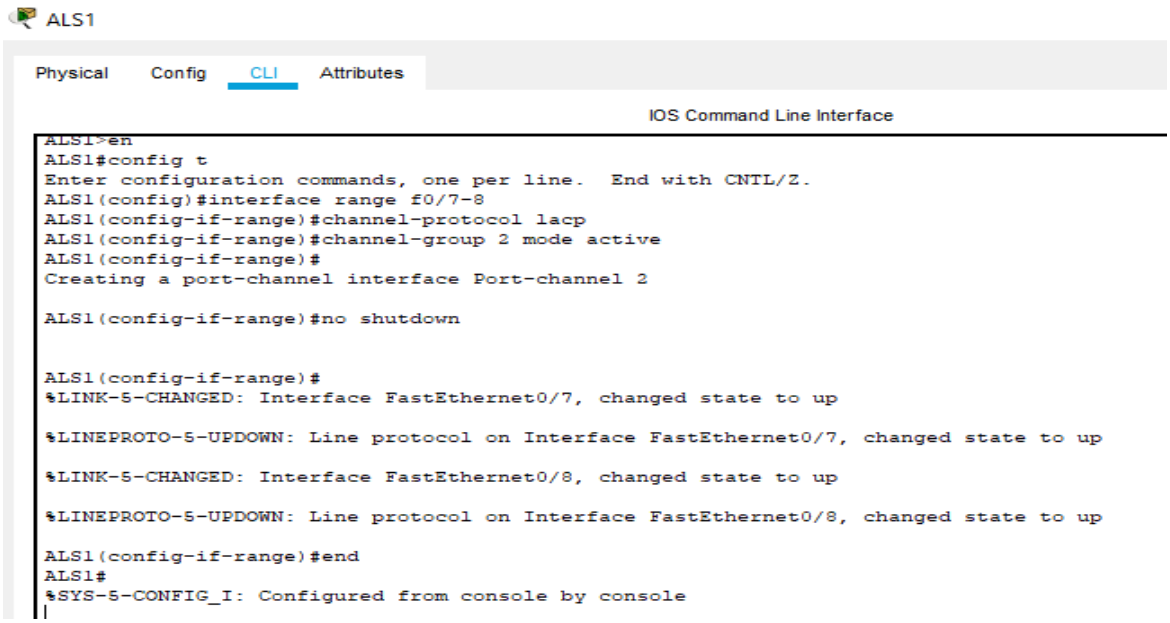
Figura 23. Configuración de las interfaces Fa0/7 y Fa0/8 en DLS2



ALS1

ALS1>en
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface range f0/7-8
ALS1(config-if-range)#channel-protocol lacp
ALS1(config-if-range)#channel-group 2 mode active
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 2
ALS1(config-if-range)#no shutdown
ALS1(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
ALS1(config-if-range)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 24. Configuración de las interfaces Fa0/7 y Fa0/8 en ALS1



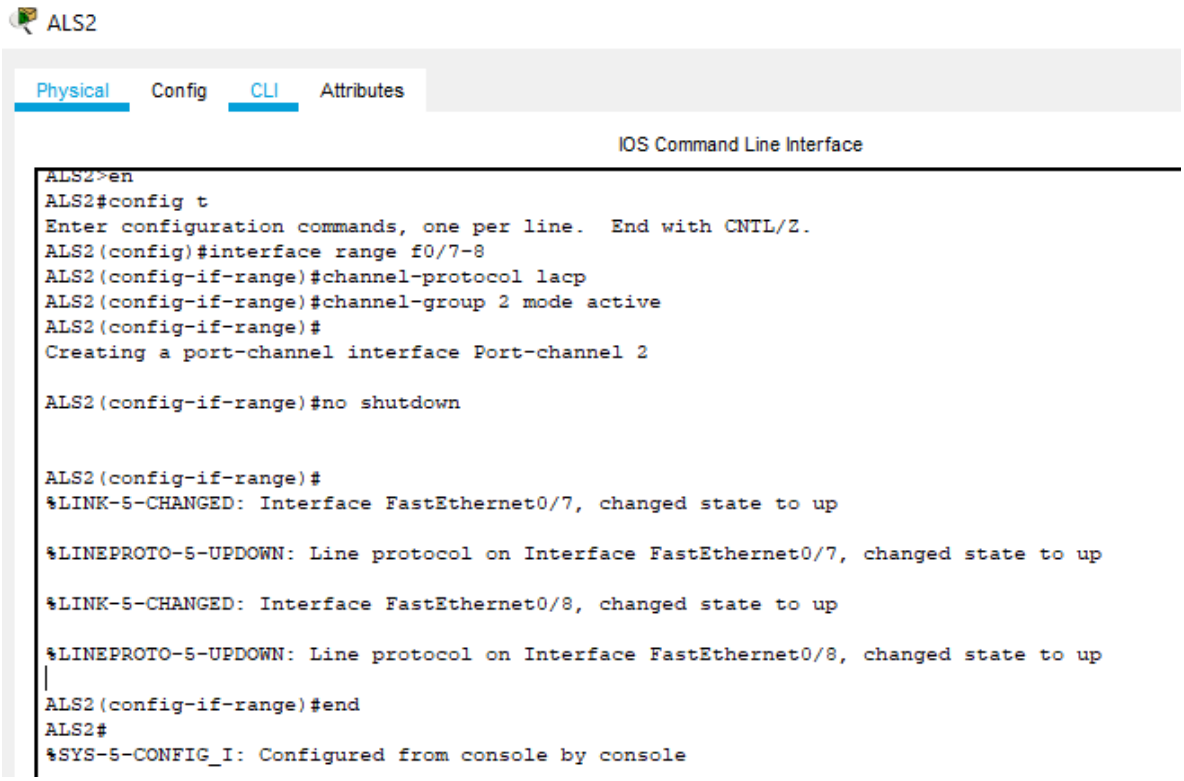
ALS2

ALS2>en
ALS2#config t

Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface range f0/7-8
ALS2(config-if-range)#channel-protocol lacp
ALS2(config-if-range)#channel-group 2 mode active
ALS2(config-if-range)#
Creating a port-channel interface Port-channel 2

ALS2(config-if-range)#no shutdown
ALS2(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
ALS2(config-if-range)#end
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 25. Configuración de las interfaces Fa0/7 y Fa0/8 en ALS2

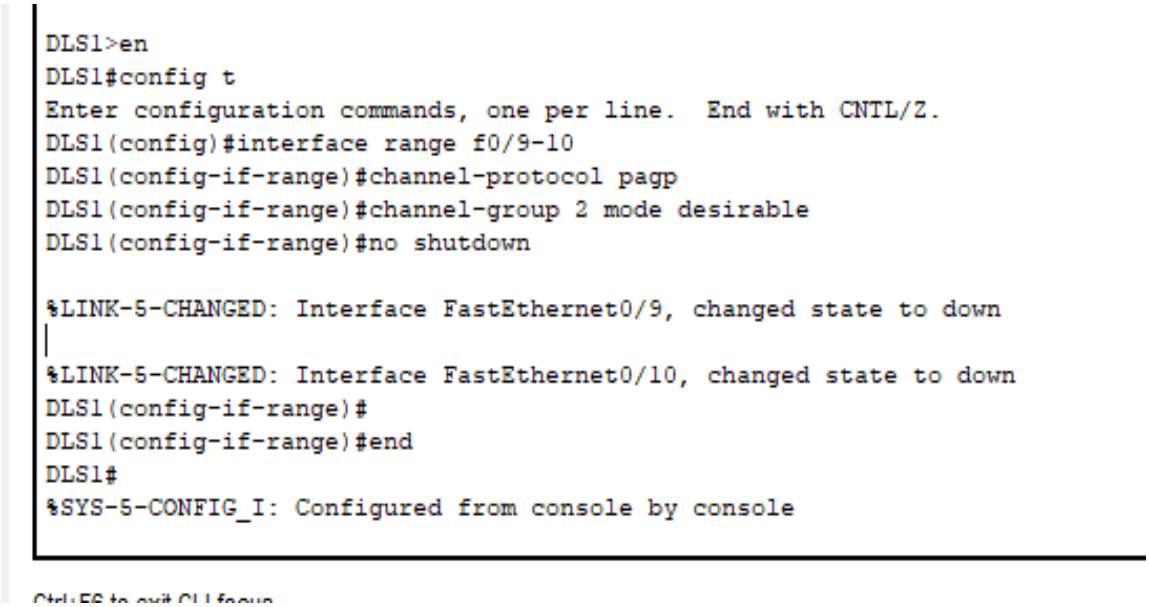


3. Los Port-channels en las interfaces F0/9 y fa0/10 utilizará PAgP.

DLS1

```
DLS1>en
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface range f0/9-10
DLS1(config-if-range)#channel-protocol pagp
DLS1(config-if-range)#channel-group 2 mode desirable
DLS1(config-if-range)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
DLS1(config-if-range)#
DLS1(config-if-range)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 26. Establecemos el protocolo PAgP en el canal de DLS1

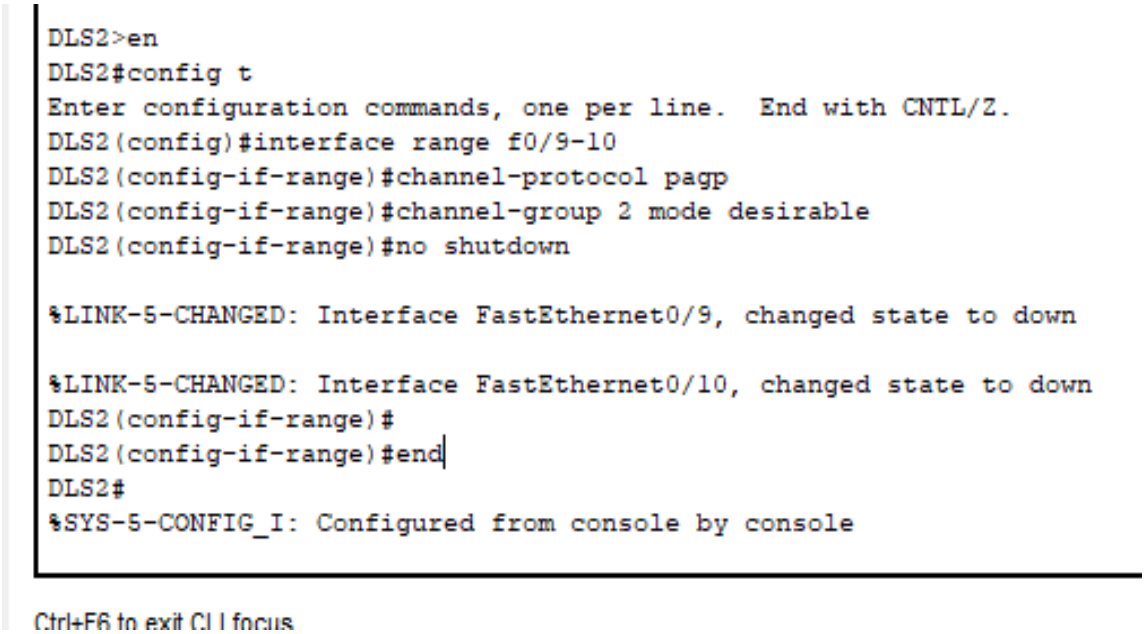


DLS2

```
DLS2>en
DLS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#interface range f0/9-10
DLS2(config-if-range)#channel-protocol pagp
DLS2(config-if-range)#channel-group 2 mode desirable
DLS2(config-if-range)#no shutdown
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to down
```

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
DLS2(config-if-range)#
DLS2(config-if-range)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

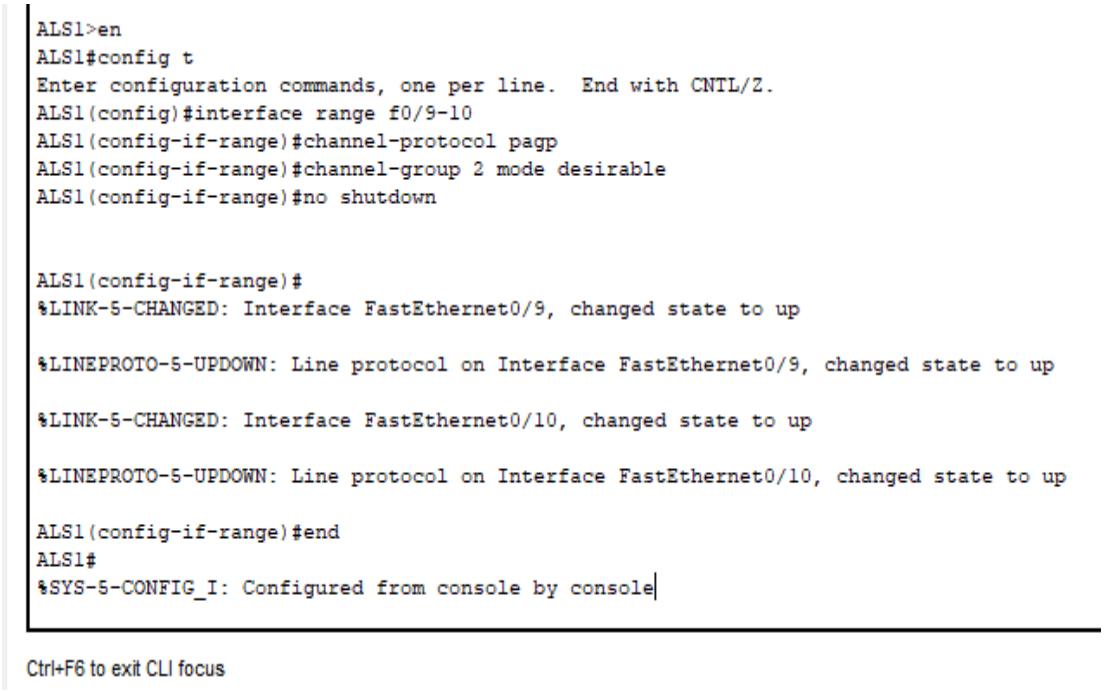
Figura 27. Establecemos el protocolo PAgP en el canal de DLS2



ALS1

ALS1>en
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface range f0/9-10
ALS1(config-if-range)#channel-protocol pagp
ALS1(config-if-range)#channel-group 2 mode desirable
ALS1(config-if-range)#no shutdown
ALS1(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
ALS1(config-if-range)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

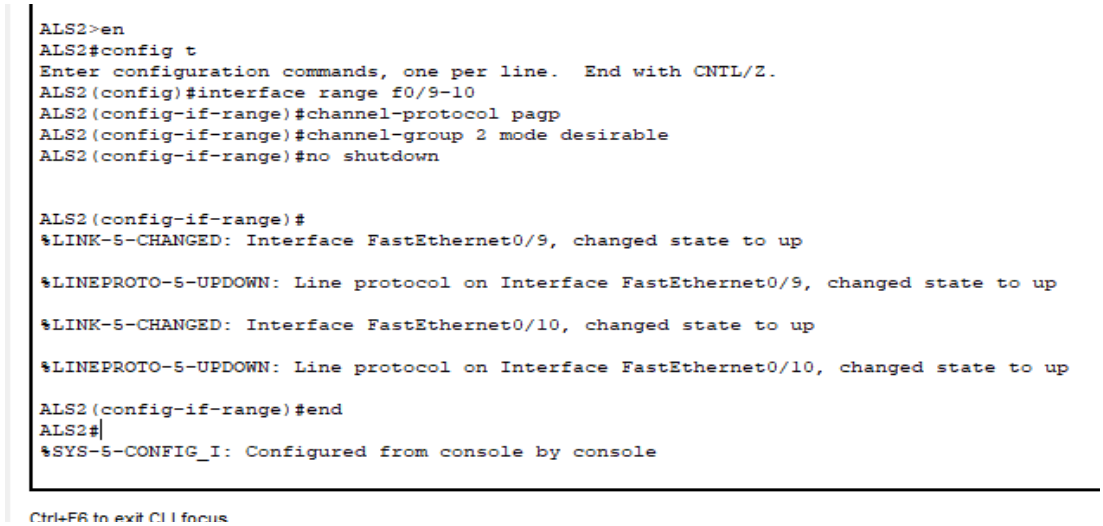
Figura 28. Establecemos el protocolo PAgP en el canal de ALS1



ALS2

ALS2>en
ALS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface range f0/9-10
ALS2(config-if-range)#channel-protocol pagp
ALS2(config-if-range)#channel-group 2 mode desirable
ALS2(config-if-range)#no shutdown
ALS2(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
ALS2(config-if-range)#end
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 29. Establecemos el protocolo PAgP en el canal de ALS2



4. Todos los puertos troncales serán asignados a la VLAN 500 como la VLAN nativa.

En este punto realizamos ingresamos el comando switchport troncalizado con Trunk, asignando como nativa la VLAN 500.

DLS1

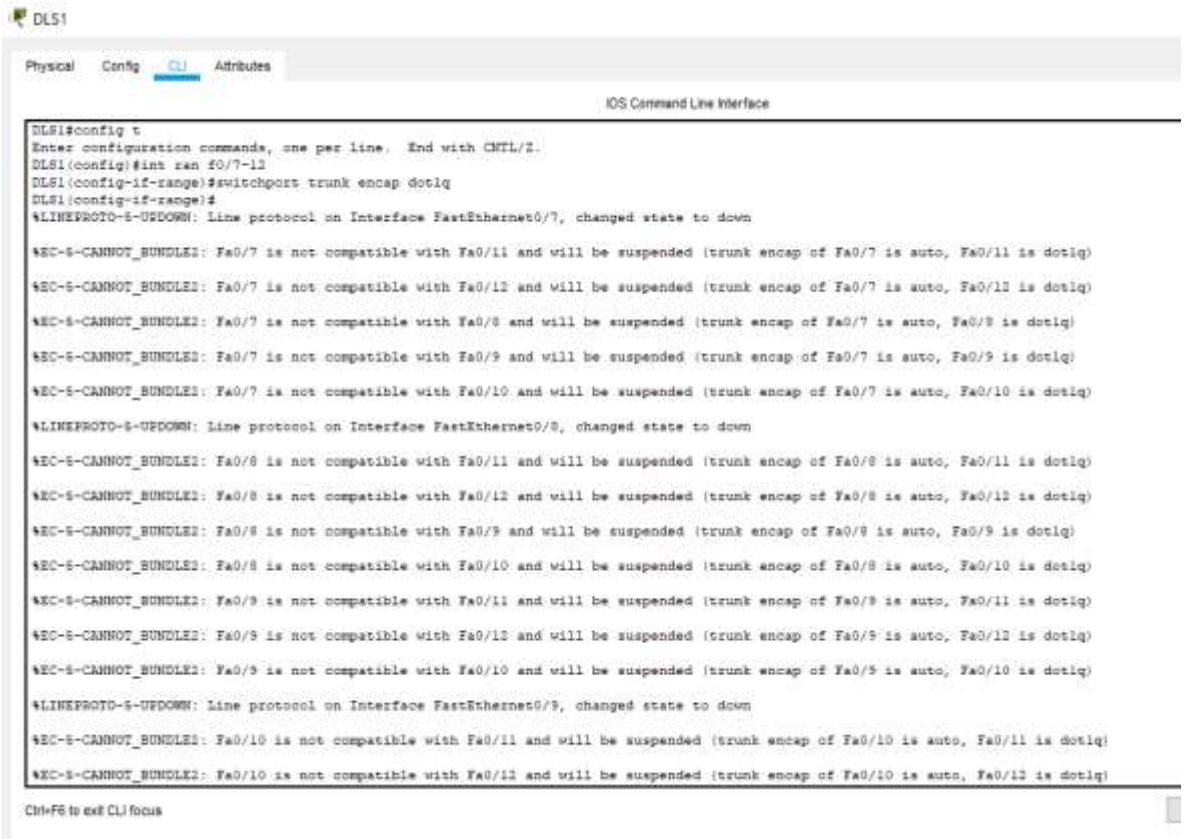
DLS1>en
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#int ran f0/7-12
DLS1(config-if-range)#switchport trunk encap dot1q
DLS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/12 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/8 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/8 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/9 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/9 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/10 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/10 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/12 is dot1q)

%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/9 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/9 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/10 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/10 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/9 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/9 is auto, Fa0/12 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/10 and will be suspended (trunk encap of Fa0/9 is auto, Fa0/10 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/10 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/10 is auto, Fa0/12 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/11 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/11 is auto, Fa0/12 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINK-3-UPDOWN: Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
DLS1(config-if-range)#
%LINK-5-CHANGED: Interface Port-channel2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to up
DLS1(config-if-range)#switchport trunk native vlan 500
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Po2 and will be suspended (native vlan of Fa0/7 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Po2 and will be suspended (native vlan of Fa0/7 is 500, Po2 id 1)
%LINK-3-UPDOWN: Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Po2 and will be suspended (native vlan of Fa0/8 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Po2 and will be suspended (native vlan of Fa0/9 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Po2 and will be suspended (native vlan of Fa0/10 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/11 is not compatible with Po2 and will be suspended (native vlan of Fa0/11 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/12 is not compatible with Po2 and will be suspended (native vlan of Fa0/12 is 500, Po2 id 1)

```
DLS1(config-if-range)#switchport nonegotiate
DLS1(config-if-range)#no shutdown
DLS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
DLS1(config-if-range)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/11 (500), with DLS2 FastEthernet0/11 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/12 (500), with DLS2 FastEthernet0/12 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ALS1 FastEthernet0/7 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ALS1 FastEthernet0/8 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS2 FastEthernet0/9 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ALS2 FastEthernet0/10 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ALS1 FastEthernet0/7 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ALS1 FastEthernet0/8 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/11 (500), with DLS2 FastEthernet0/11 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/12 (500), with DLS2 FastEthernet0/12 (1).
```

Figura 30. Troncalizamos VLAN nativa la VLAN 500 en DLS1



DLS2

DLS2>en
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#int ran f0/7-12
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/11 (1), with DLS1 FastEthernet0/11 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/12 (1), with DLS1 FastEthernet0/11 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/11 (1), with DLS1 FastEthernet0/12 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/12 (1), with DLS1 FastEthernet0/12 (500).
DLS2(config-if-range)#switchport trunk encap dot1q
DLS2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/12 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/8 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/8 is dot1q)

%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/9 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/9 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/10 and will be suspended (trunk encap of Fa0/7 is auto, Fa0/10 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/12 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/9 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/9 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/10 and will be suspended (trunk encap of Fa0/8 is auto, Fa0/10 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/9 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/9 is auto, Fa0/12 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/10 and will be suspended (trunk encap of Fa0/9 is auto, Fa0/10 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/11 and will be suspended (trunk encap of Fa0/10 is auto, Fa0/11 is dot1q)
%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/10 is auto, Fa0/12 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/11 is not compatible with Fa0/12 and will be suspended (trunk encap of Fa0/11 is auto, Fa0/12 is dot1q)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINK-3-UPDOWN: Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
%SPANTREE-2-RECV_PVID_ERR: Received 802.1Q BPDU on non trunk FastEthernet0/11 VLAN1.
%SPANTREE-2-BLOCK_PVID_LOCAL: Blocking FastEthernet0/11 on VLAN0001. Inconsistent port type.
%SPANTREE-2-RECV_PVID_ERR: Received 802.1Q BPDU on non trunk FastEthernet0/12 VLAN1.
%SPANTREE-2-BLOCK_PVID_LOCAL: Blocking FastEthernet0/12 on VLAN0001. Inconsistent port type.
DLS2(config-if-range)#switchport trunk native vlan 500
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Po2 and will be suspended (native vlan of Fa0/7 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Po2 and will be suspended (native vlan of Fa0/8 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Po2 and will be suspended (native vlan of Fa0/9 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Po2 and will be suspended (native vlan of Fa0/10 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/11 is not compatible with Po2 and will be suspended (native vlan of Fa0/11 is 500, Po2 id 1)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/12 is not compatible with Po2 and will be suspended (native vlan of Fa0/12 is 500, Po2 id 1)
DLS2(config-if-range)#switchport nonegotiate
DLS2(config-if-range)#no shutdown
DLS2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to up
DLS2(config-if-range)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS1 FastEthernet0/9 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ALS1 FastEthernet0/10 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS1 Port-channel2 (1).
DLS2#

Figura 31. Troncalizamos VLAN nativa la VLAN 500 en DLS2

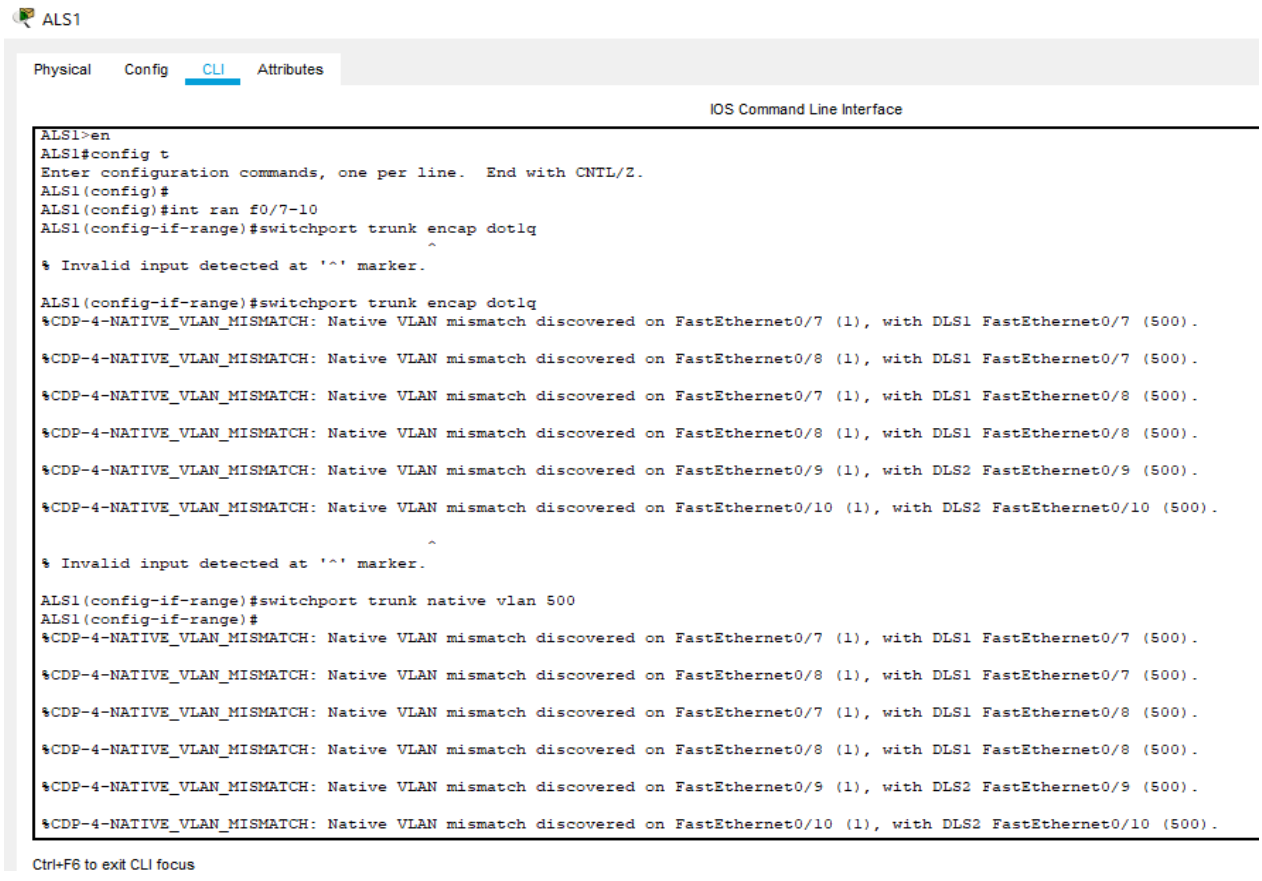
ALS1

ALS1>en
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#
ALS1(config)#int ran f0/7-10
ALS1(config-if-range)#switchport trunk encap dot1q
ALS1(config-if-range)#switchport trunk encap dot1q
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS1 FastEthernet0/7 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DLS1 FastEthernet0/7 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS1 FastEthernet0/8 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DLS1 FastEthernet0/8 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (1), with DLS2 FastEthernet0/9 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (1), with DLS2 FastEthernet0/10 (500).
ALS1(config-if-range)#switchport trunk native vlan 500
ALS1(config-if-range)#

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS1 FastEthernet0/7 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DLS1 FastEthernet0/7 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS1 FastEthernet0/8 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DLS1 FastEthernet0/8 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (1), with DLS2 FastEthernet0/9 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (1), with DLS2 FastEthernet0/10 (500).
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/8 and will be suspended (dtp mode of Fa0/7 is on, Fa0/8is off)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/9 and will be suspended (dtp mode of Fa0/7 is on, Fa0/9is off)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/7 is on, Fa0/10is off)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/8 and will be suspended (dtp mode of Fa0/7 is on, Fa0/8is off)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/9 and will be suspended (dtp mode of Fa0/7 is on, Fa0/9is off)
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/7 is on, Fa0/10is off)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/7 and will be suspended (dtp mode of Fa0/9 is off, Fa0/7is on)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/7 and will be suspended (dtp mode of Fa0/10 is off, Fa0/7is on)
%LINK-3-UPDOWN: Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/9 and will be suspended (dtp mode of Fa0/8 is on, Fa0/9is off)
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/8 is on, Fa0/10is off)
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/9 is on, Fa0/10is off)
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
ALS1(config-if-range)#switchport nonegotiate
ALS1(config-if-range)#no shutdown
ALS1(config-if-range)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 32. Troncalizamos VLAN nativa la VLAN 500 en ALS1

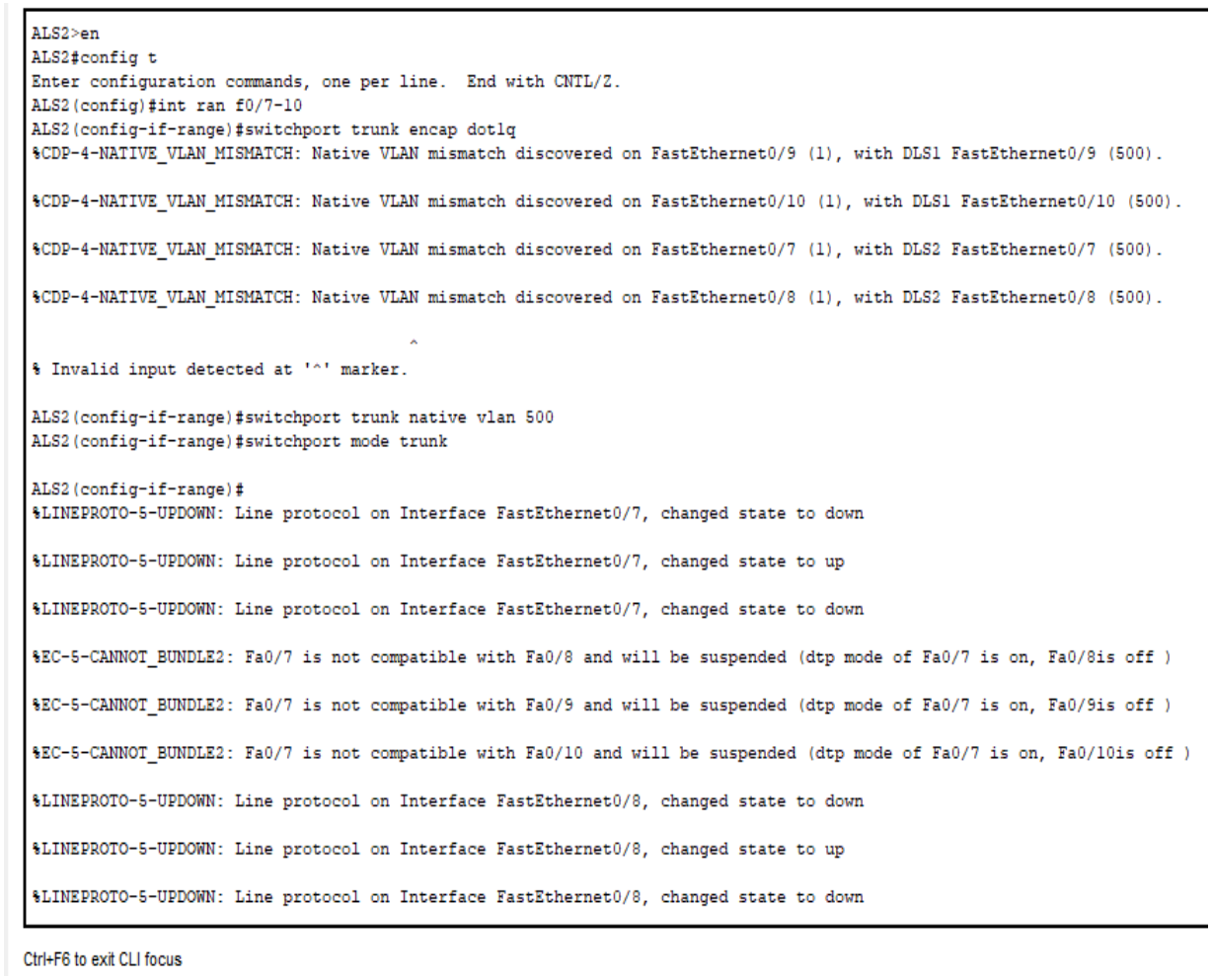


ALS2

```
ALS2>en
ALS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS2(config)#int ran f0/7-10
ALS2(config-if-range)#switchport trunk encap dot1q
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (1), with DLS1 FastEthernet0/9 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (1), with DLS1 FastEthernet0/10 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS2 FastEthernet0/7 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DLS2 FastEthernet0/8 (500).
ALS2(config-if-range)#switchport trunk native vlan 500
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/8 and will be suspended (dtp mode of Fa0/7 is on, Fa0/8is off )
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/9 and will be suspended (dtp mode of Fa0/7 is on, Fa0/9is off )
%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/7 is on, Fa0/10is off )
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/9 and will be suspended (dtp mode of Fa0/8 is on, Fa0/9is off )
%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/8 is on, Fa0/10is off )
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/10 and will be suspended (dtp mode of Fa0/9 is on, Fa0/10is off )
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
ALS2(config-if-range)#switchport nonegotiate
ALS2(config-if-range)#no shutdown
ALS2(config-if-range)#end
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 33. Troncalizamos VLAN nativa la VLAN 500 en ALS2



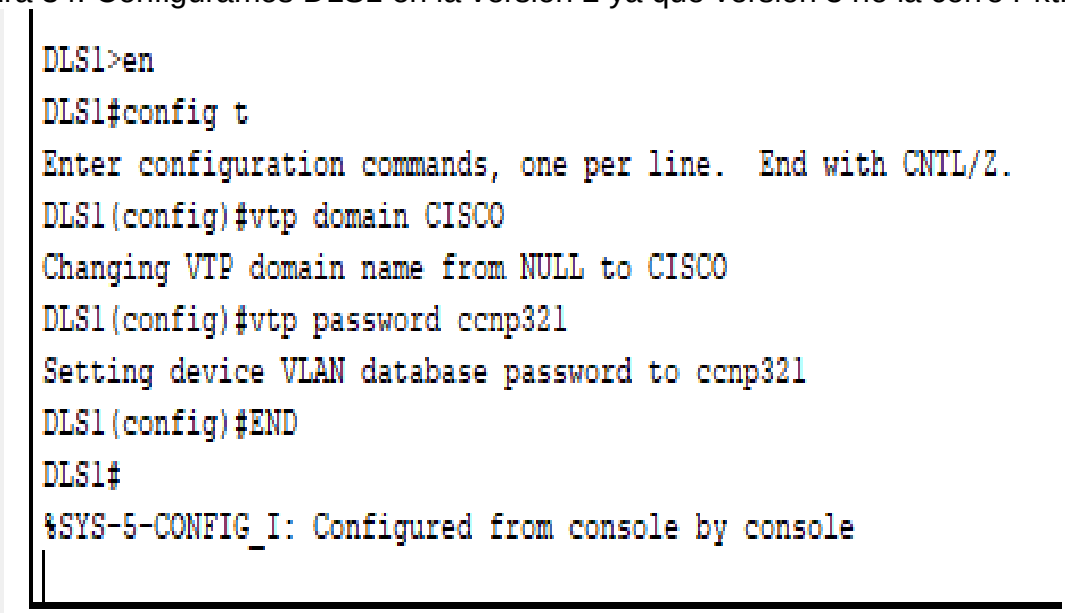
d. Configurar DLS1, ALS1, y ALS2 para utilizar VTP versión 3

1. Utilizar el nombre de dominio CISCO con la contraseña ccnp321

DLS1

```
DLS1>en
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
DLS1(config)#vtp password ccnp321
Setting device VLAN database password to ccnp321
DLS1(config)#END
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

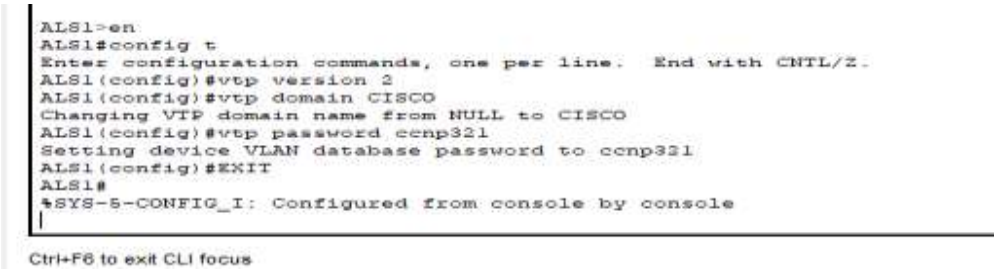
Figura 34. Configuramos DLS1 en la versión 2 ya que versión 3 no la corre Pkt.



ALS1

```
ALS1>en
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#vtp version 2
ALS1(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
ALS1(config)#vtp password ccnp321
Setting device VLAN database password to ccnp321
ALS1(config)#EXIT
ALS1#
%SYS-5-CONFIG_I: Configured from console by console
```

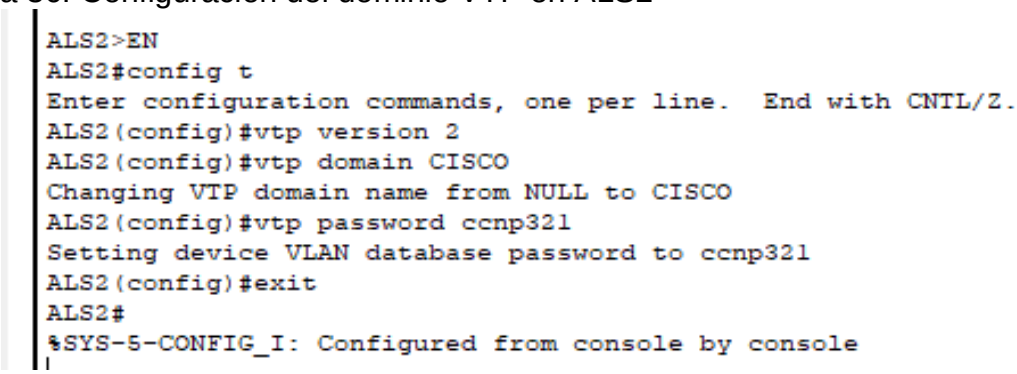
Figura 35. Configuración del dominio VTP en ALS1



ALS2

ALS2>EN
ALS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#vtp version 2
ALS2(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
ALS2(config)#vtp password ccnp321
Setting device VLAN database password to ccnp321
ALS2(config)#exit
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 36. Configuración del dominio VTP en ALS2

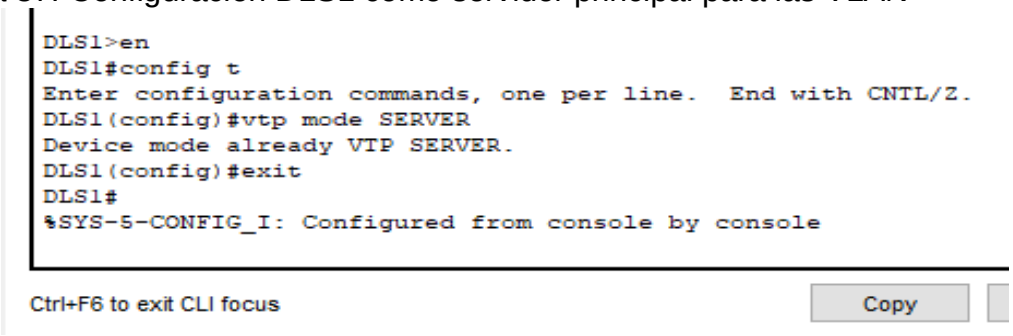


2. Configurar DLS1 como servidor principal para las VLAN.

DLS1

DLS1>en
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#vtp mode SERVER
Device mode already VTP SERVER.
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 37. Configuración DLS1 como servidor principal para las VLAN

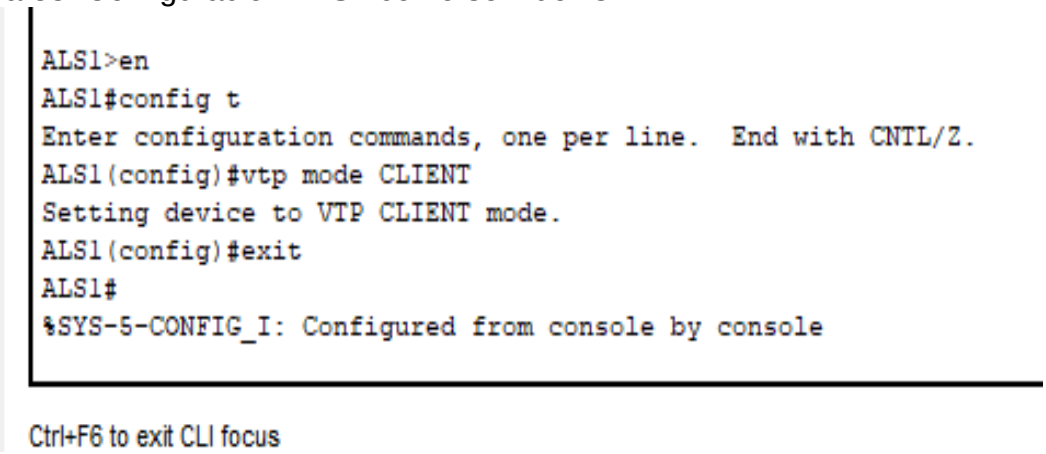


3. Configurar ALS1 y ALS2 como clientes VTP.

ALS1

ALS1>en
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#vtp mode CLIENT
Setting device to VTP CLIENT mode.
ALS1(config)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 38. Configuración ALS1 como servidor CLIENT VTP



ALS2

ALS2>EN
ALS2#CONFIG T
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#vtp mode CLIENT
Setting device to VTP CLIENT mode.
ALS2(config)#EXIT
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 39. Configuración ALS2 como servidor CLIENT VTP

```
ALS2>EN
ALS2#CONFIG T
Enter configuration commands, one per line.  End with CNTL/Z.
ALS2(config)#vtp mode CLIENT
Setting device to VTP CLIENT mode.
ALS2(config)#EXIT
ALS2#
%SYS-5-CONFIG_I: Configured from console by console
```

Ctrl+F6 to exit CLI focus Copy

e. Configurar en el servidor principal las siguientes VLAN

Tabla 3. Configuración de la distribución de VLAN principales

N° de VLAN	Nombre de VLAN	N° de VLAN	Nombre de VLAN
500	NATIVA	434	PROVEEDORES
12	ADMON	123	SEGUROS
234	CLIENTES	1010	VENTAS
1111	MULTIMEDIA	3456	PERSONAL

DLS1

```
DLS1>en
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#vlan 500
DLS1(config-vlan)#
%LINK-5-CHANGED: Interface Vlan500, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan500, changed state to up
DLS1(config-vlan)#name NATIVA
DLS1(config-vlan)#exit
DLS1(config)#vlan 12
DLS1(config-vlan)#name ADMON
DLS1(config-vlan)#exit
DLS1(config)#vlan 234
DLS1(config-vlan)#name CLIENTES
DLS1(config-vlan)#EXIT
```

```
DLS1(config)#vlan 1111
DLS1(config)#vlan 111
DLS1(config-vlan)#name MULTIMEDIA
DLS1(config-vlan)#exit
DLS1(config)#vlan 434
DLS1(config-vlan)#name PROVEEDORES
DLS1(config-vlan)#exit
DLS1(config)#vlan 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#EXIT
DLS1(config)#vlan 1010
DLS1(config)#vlan 101
DLS1(config-vlan)#name VENTAS
DLS1(config-vlan)#exit
DLS1(config)#vlan 3456
DLS1(config)#name PERSONAL
DLS1(config)#vlan 345
DLS1(config-vlan)#name PERSONAL
DLS1(config-vlan)#exit
DLS1(config)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 40. Configuración y distribución de las VLAN

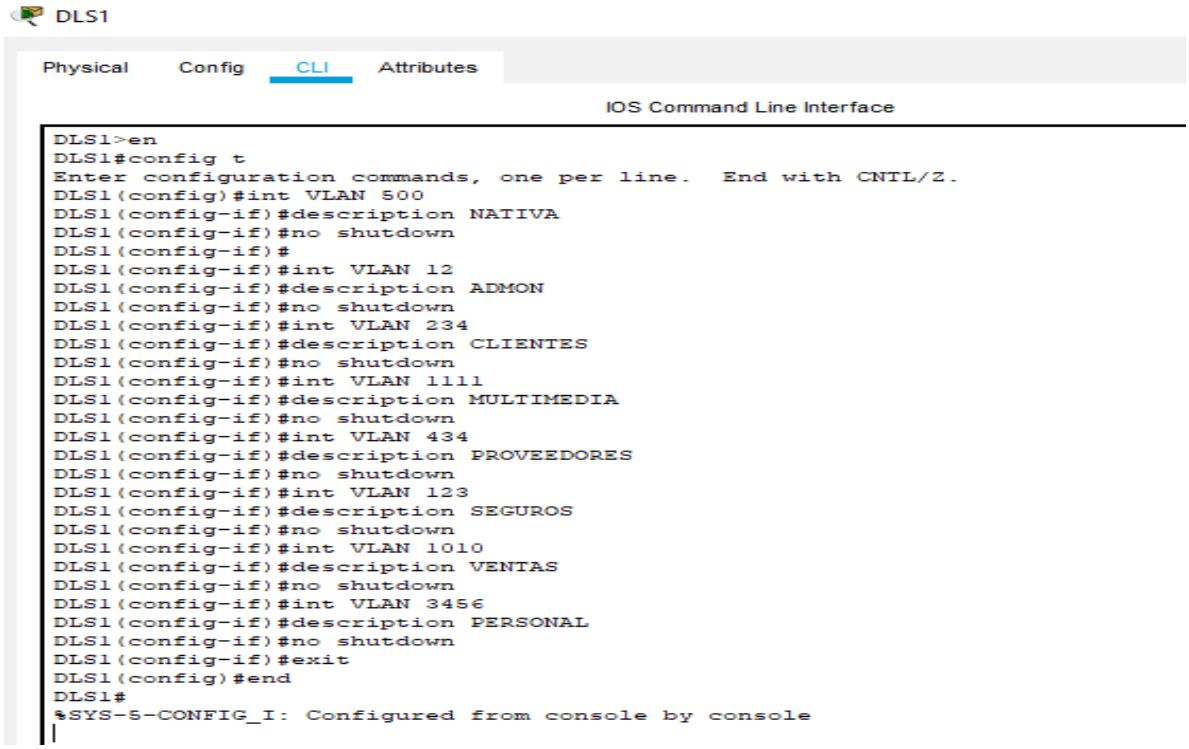


Figura 41. Activación de las VLAN

```
DLS1#SHOW VLAN

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Po2, Po4, Fa0/1, 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
12   ADMON                            active
101  VENTAS                           active
111  MULTIMEDIA                       active
123  SEGUROS                          active
234  CLIENTES                         active
345  PERSONAL                         active
434  PROVEEDORES                      active
500  NATIVA                           active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
```

f. En DLS1, suspender la VLAN 434.

DLS1

DLS1#
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#no vlan 434
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 42. Suspensión de VLAN 434

```
DLS1#
DLS1#
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#no vlan 434
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Po2, Po4, Fa0/1, 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
12   ADMON                             active
101  VENTAS                            active
111  MULTIMEDIA                        active
123  SEGUROS                           active
234  CLIENTES                          active
345  PERSONAL                          active
500  NATIVA                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
```

g. Configurar DLS2 en modo VTP transparente VTP utilizando VTP versión 2, y configurar en DLS2 las mismas VLAN que en DLS1.

DLS2

```
DLS2>en
DLS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#vtp version 2
VTP mode already in V2.
DLS2(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
DLS2(config)#vlan 500
DLS2(config-vlan)#name NATIVA
DLS2(config-vlan)#exit
DLS2(config)#vlan 12
DLS2(config-vlan)#name ADMON
DLS2(config-vlan)#exit
DLS2(config)#vlan 234
DLS2(config-vlan)#name CLIENTES
DLS2(config-vlan)#exit
DLS2(config)#vlan 111
DLS2(config-vlan)#name MULTIMEDIA
DLS2(config-vlan)#exit
DLS2(config)#vlan 434
DLS2(config-vlan)#name PROVEEDORES
```

DLS2(config-vlan)#exit
DLS2(config)#vlan 123
DLS2(config-vlan)#name SEGUROS
DLS2(config-vlan)#EXIT
DLS2(config)#vlan 101
DLS2(config-vlan)#name VENTAS
DLS2(config-vlan)#exit
DLS2(config)#vlan 345
DLS2(config-vlan)#name PERSONAL
DLS2(config-vlan)#exit
DLS2(config)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 43. Activación de las VLAN en DLS2

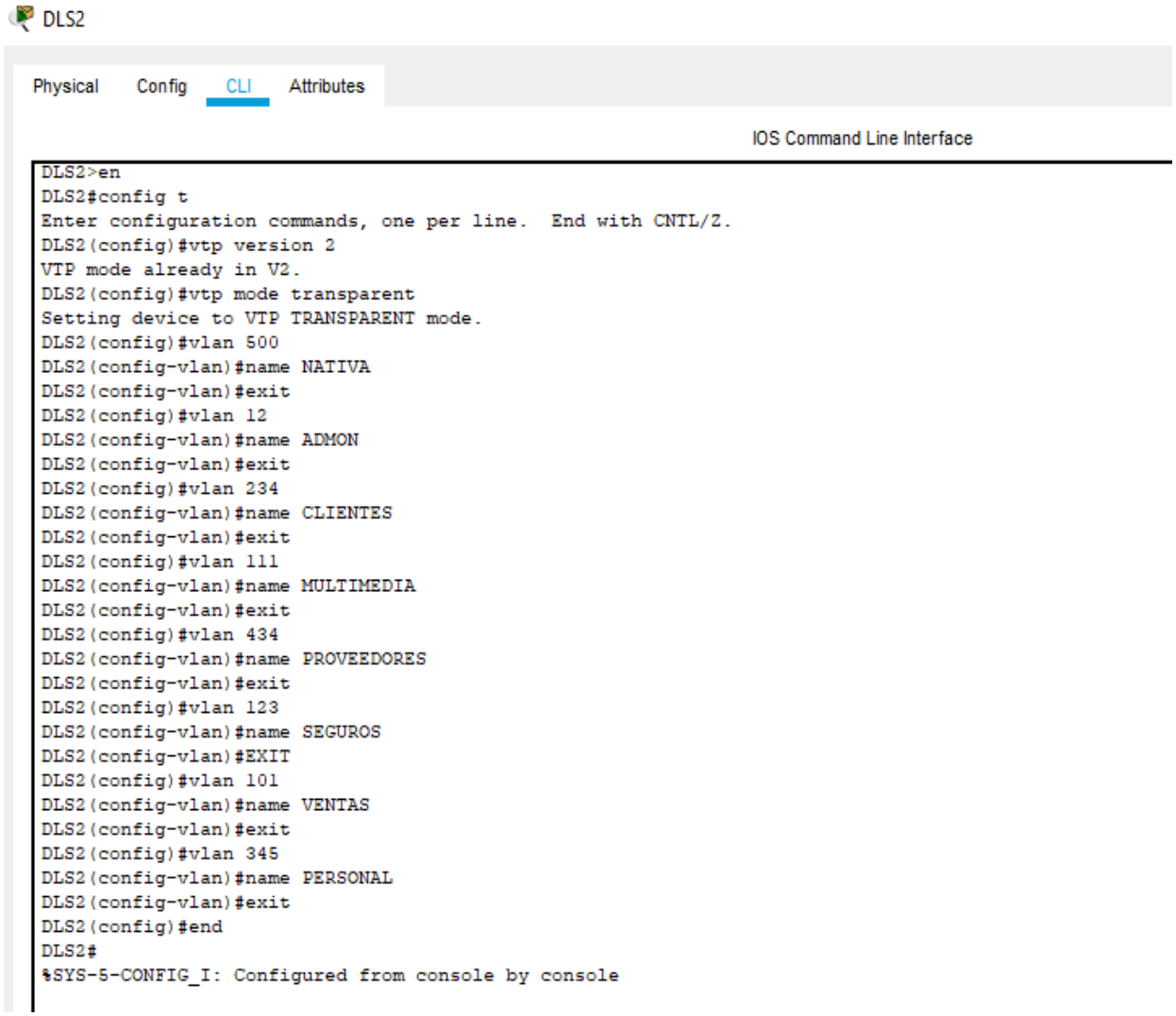


Figura 44. Activación de las VLAN en DLS2

```
DLS2#show vlan

VLAN Name                                Status    Ports
---- ----------------------------------- --------- -------------------------------
1    default                             active    Po2, Po3, Fa0/1, Fa0/2
                                                   Fa0/3, Fa0/4, Fa0/5, Fa0/6
                                                   Fa0/7, 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
12   ADMON                               active
101  VENTAS                              active
111  MULTIMEDIA                          active
123  SEGUROS                             active
234  CLIENTES                            active
345  PERSONAL                            active
434  PROVEEDORES                         active
500  NATIVA                              active
1002 fddi-default                        active
1003 token-ring-default                  active
1004 fddinet-default                     active
1005 trnet-default                       active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
```

h. Suspender VLAN 434 en DLS2.

DLS2

DLS2#
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#no vlan 434
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 45. Suspensión VLAN 434

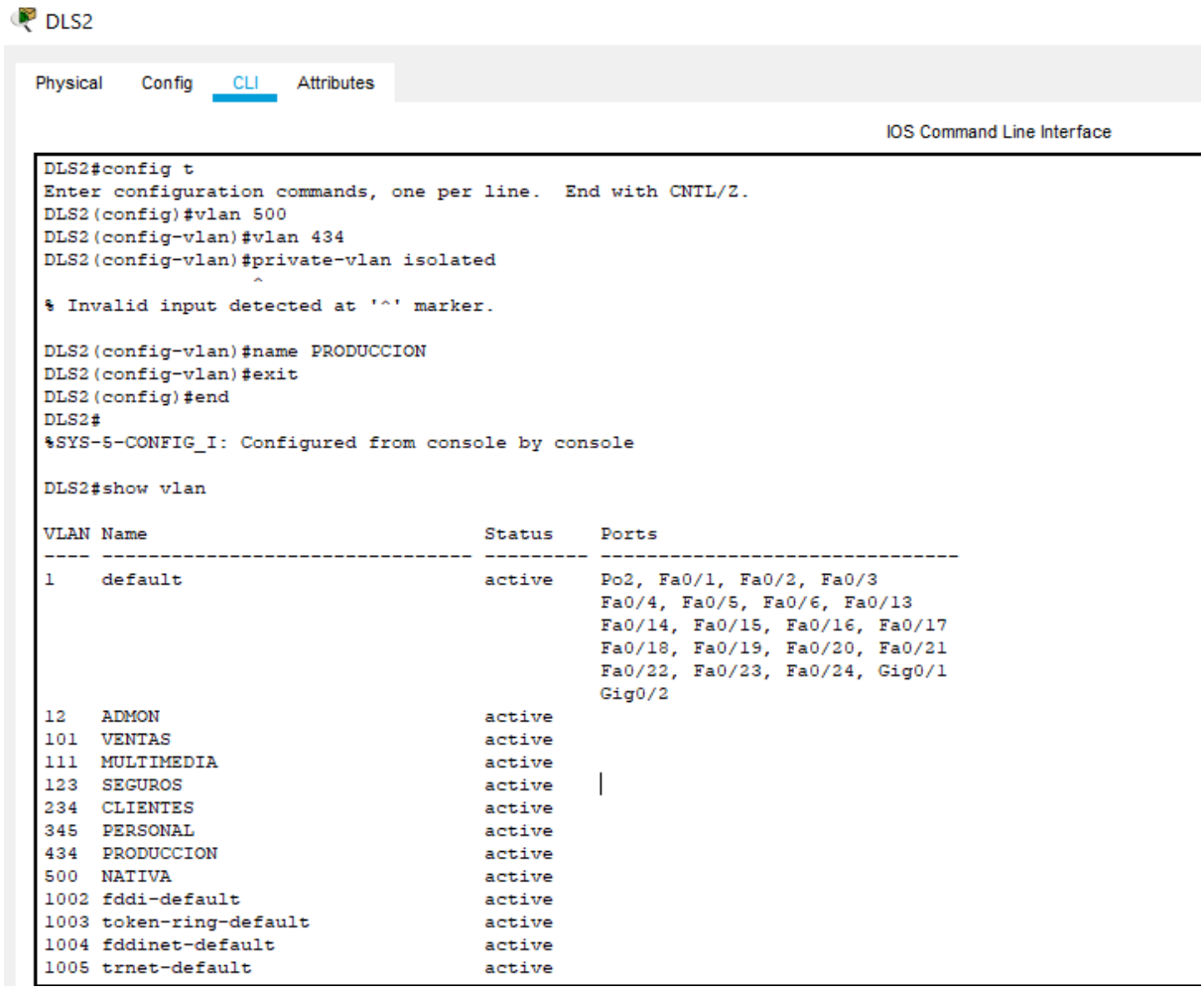
```
DLS2#
DLS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#no vlan 434
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

DLS2#show vlan

VLAN Name                                Status    Ports
---- ----------------------------------- --------- -------------------------------
1    default                             active    Po2, Po3, Fa0/1, Fa0/2
                                                   Fa0/3, Fa0/4, Fa0/5, Fa0/6
                                                   Fa0/7, 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
12   ADMON                               active
101  VENTAS                              active
111  MULTIMEDIA                          active
123  SEGUROS                             active
234  CLIENTES                            active
345  PERSONAL                            active
500  NATIVA                              active
1002 fddi-default                        active
1003 token-ring-default                  active
1004 fddinet-default                     active
1005 trnet-default                       active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
```

i. En DLS2, crear VLAN 567 con el nombre de PRODUCCION. La VLAN de PRODUCCION no podrá estar disponible en cualquier otro Switch de la red.

DLS2

```
DLS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#vlan 500
DLS2(config-vlan)#vlan 434
DLS2(config-vlan)#private-vlan isolated
DLS2(config-vlan)#name PRODUCCION
DLS2(config-vlan)#exit
DLS2(config)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 46. Configuracion VLAN 567 en DLS2



j. Configurar DLS1 como Spanning tree root para las VLAN 1, 12, 434, 500, 1010, 1111 y 3456 y como raíz secundaria para las VLAN 123 y 234.

DLS1

```
DLS1>en
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#spanning-tree vlan 1 root primary
DLS1(config)#spanning-tree vlan 12 root primary
DLS1(config)#spanning-tree vlan 434 root primary
DLS1(config)#spanning-tree vlan 500 root primary
DLS1(config)#spanning-tree vlan 101 root primary
DLS1(config)#spanning-tree vlan 111 root primary
DLS1(config)#spanning-tree vlan 345 root primary
DLS1(config)#spanning-tree vlan 123 root secondary
DLS1(config)#spanning-tree vlan 234 root secondary
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 47. Configuracion DLS1 las VLAN primaria y secundaria

```
------- --------- ----------------- ------------------------------------
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#spanning-tree vlan 1 root primary
DLS1(config)#spanning-tree vlan 12 root primary
DLS1(config)#spanning-tree vlan 434 root primary
DLS1(config)#spanning-tree vlan 500 root primary
DLS1(config)#spanning-tree vlan 101 root primary
DLS1(config)#spanning-tree vlan 111 root primary
DLS1(config)#spanning-tree vlan 345 root primary
DLS1(config)#spanning-tree vlan 123 root secondary
DLS1(config)#spanning-tree vlan 234 root secondary
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#
```

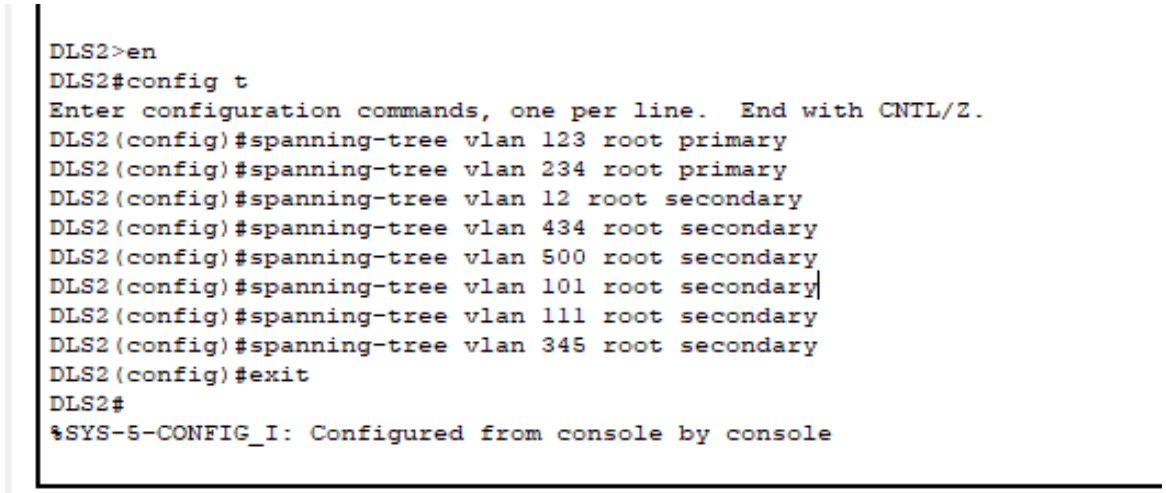
k. Configurar DLS2 como Spanning tree root para las VLAN 123 y 234 y como una raíz secundaria para las VLAN 12, 434, 500, 1010, 1111 y 3456.

DLS2

```
DLS2>en
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#spanning-tree vlan 123 root primary
DLS2(config)#spanning-tree vlan 234 root primary
```

DLS2(config)#spanning-tree vlan 12 root secondary
DLS2(config)#spanning-tree vlan 434 root secondary
DLS2(config)#spanning-tree vlan 500 root secondary
DLS2(config)#spanning-tree vlan 101 root secondary
DLS2(config)#spanning-tree vlan 111 root secondary
DLS2(config)#spanning-tree vlan 345 root secondary
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 48. Configuracion DLS2 de las VLAN primaria y secundaria

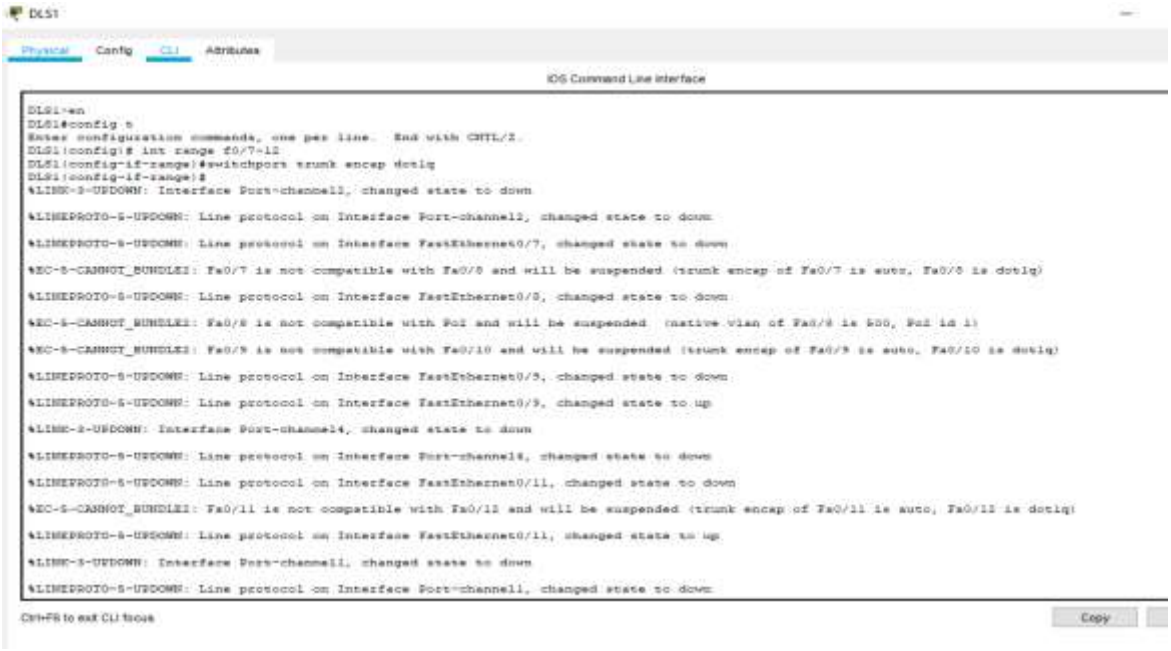


l. Configurar todos los puertos como troncales de tal forma que solamente las VLAN que se han creado se les permitirán circular a través de éstos puertos.

DLS1

DLS1>en
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)# int range f0/7-12
DLS1(config-if-range)#switchport trunk encap dot1q
DLS1(config-if-range)#
DLS1(config-if-range)#switchport trunk native vlan 500
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#exit
DLS1(config)#
%LINK-5-CHANGED: Interface Port-channel1, changed state to up

Figura 49. Configuracion DLS1 de los puertos troncales en las interfaces



DLS2

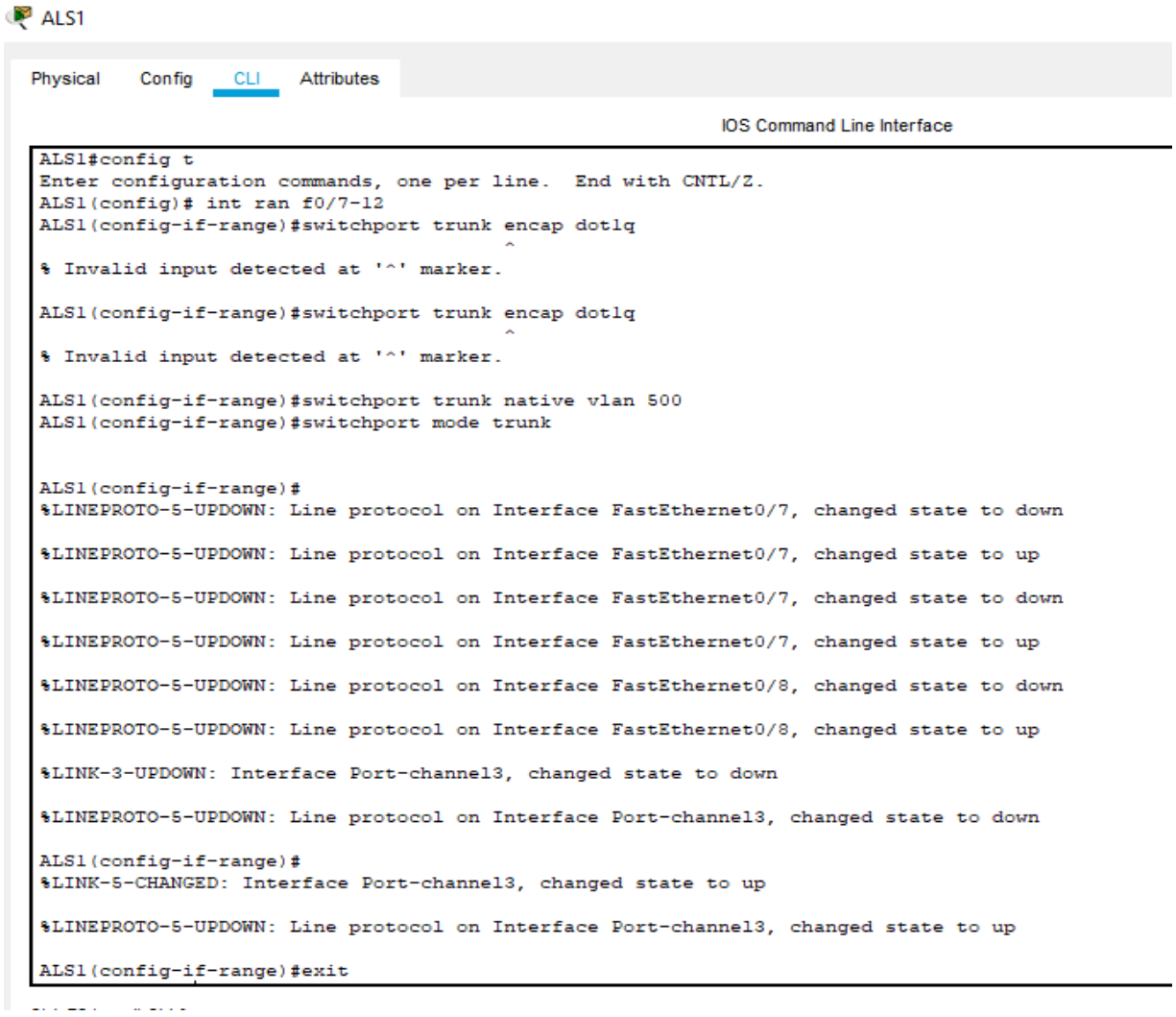
DLS2(config)# int ran f0/7-12
DLS2(config-if-range)# switchport trunk encap dot1q
DLS2(config-if-range)# switchport trunk native vlan 500
DLS2(config-if-range)# switchport mode trunk
DLS2(config-if-range)#exit

Figura 50. Configuracion DLS2 de los puertos troncales en las interfaces

ALS1

```
ALS1(config)# int ran f0/7-12
ALS1(config-if-range)# switchport trunk encap dot1q
ALS1(config-if-range)# switchport trunk native vlan 500
ALS1(config-if-range)# switchport mode trunk
ALS1(config-if-range)#exit
```

Figura 51. Configuracion ALS1 de los puertos troncales en las interfaces



ALS2

```
ALS1(config)# int ran f0/7-12
ALS1(config-if-range)# switchport trunk encap dot1q
ALS1(config-if-range)# switchport trunk native vlan 500
ALS1(config-if-range)# switchport mode trunk
ALS1(config-if-range)#exit
```

Figura 52. Configuracion ALS2 de los puertos troncales en las interfaces

m. Configurar las siguientes interfaces como puertos de acceso, asignados a las VLAN de la siguiente manera:

Tabla 4. Configuración interfaces puertos de acceso asignados a las VLANs

Interfaz	DLS1	DLS2	ALS1	ALS2
Interfaz F0/6	3456	12, 1010	123, 1010	234
Interfaz F0/15	1111	1111	1111	1111
Interfaz F0/16-18		567		

DLS1

DLS1>en
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface fastethernet 0/6
DLS1(config-if)#switchport access vlan 345
DLS1(config-if)#no shutdown
DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
DLS1(config-if)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)# interface fastethernet 0/15
DLS1(config-if)#switchport access vlan 111
DLS1(config-if)#no shutdown
DLS1(config-if)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

Figura 53. Configuracion DLS1 de los puertos de los puertos de acceso a las VLANs

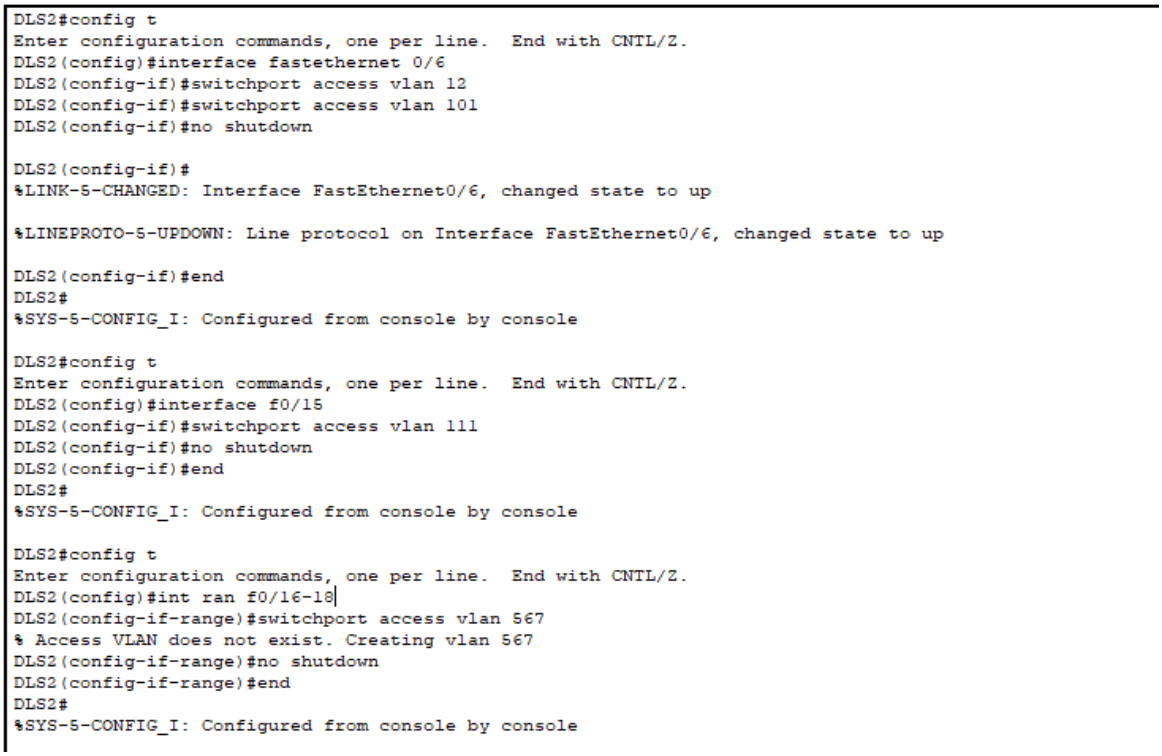
```
DLS1>en
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface fastethernet 0/6
DLS1(config-if)#switchport access vlan 3456
% Access VLAN does not exist. Creating vlan 3456
DLS1(config-if)#switchport access vlan 345
DLS1(config-if)#no shutdown

DLS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

DLS1(config-if)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)# interface fastethernet 0/15
DLS1(config-if)#switchport access vlan 111
DLS1(config-if)#no shutdown
DLS1(config-if)#end
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

DLS2

DLS2>en
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface fastethernet 0/6
DLS2(config-if)#switchport access vlan 12
DLS2(config-if)#switchport access vlan 101
DLS2(config-if)#no shutdown
DLS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
DLS2(config-if)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface f0/15
DLS2(config-if)#switchport access vlan 111
DLS2(config-if)#no shutdown
DLS2(config-if)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#int ran f0/16-18
DLS2(config-if-range)#switchport access vlan 567
% Access VLAN does not exist. Creating vlan 567
DLS2(config-if-range)#no shutdown
DLS2(config-if-range)#end
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

Figura 54. Configuracion DLS2 de los puertos de los puertos de acceso a las VLANs



ALS1

ALS1>en
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface fastethernet 0/6
ALS1(config-if)#switchport access vlan 123
ALS1(config-if)#switchport access vlan 101
ALS1(config-if)#no shutdown
ALS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
ALS1(config-if)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface fastethernet 0/15
ALS1(config-if)#switchport access vlan 111
ALS1(config-if)#no shutdown
ALS1(config-if)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

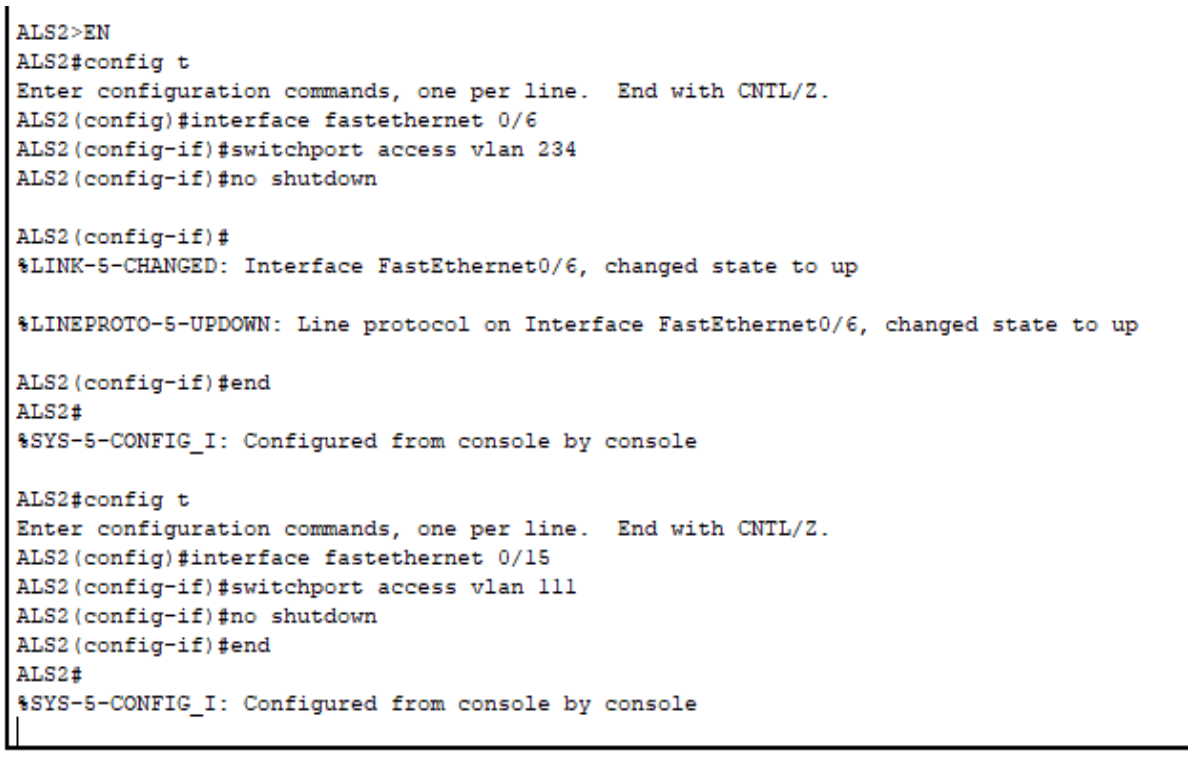
Figura 55. Configuracion ALS1 de los puertos de los puertos de acceso a las VLANs

```
ALS1>en
ALS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#interface fastethernet 0/6
ALS1(config-if)#switchport access vlan 123
ALS1(config-if)#switchport access vlan 101
ALS1(config-if)#no shutdown

ALS1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

ALS1(config-if)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

ALS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#interface fastethernet 0/15
ALS1(config-if)#switchport access vlan 111
ALS1(config-if)#no shutdown
ALS1(config-if)#end
ALS1#
%SYS-5-CONFIG_I: Configured from console by console
```

ALS2

```
ALS2>EN
ALS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS2(config)#interface fastethernet 0/6
ALS2(config-if)#switchport access vlan 234
ALS2(config-if)#no shutdown
ALS2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to
up
ALS2(config-if)#end
ALS2#
%SYS-5-CONFIG_I: Configured from console by console
ALS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS2(config)#interface fastethernet 0/15
ALS2(config-if)#switchport access vlan 111
ALS2(config-if)#no shutdown
ALS2(config-if)#end
ALS2#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 56. Configuracion ALS2 de los puertos de los puertos de acceso a las VLANs



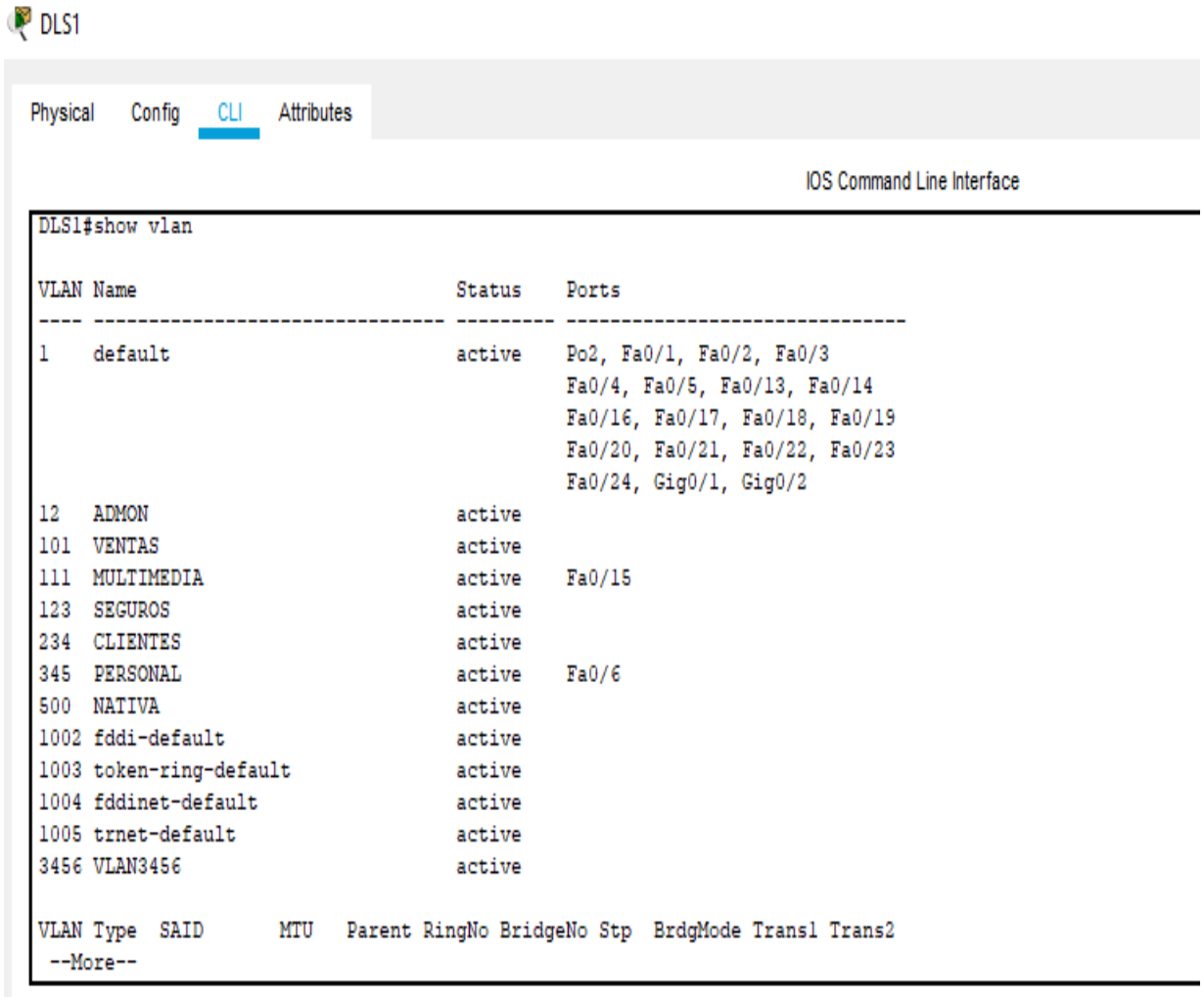
Parte 2: conectividad de red de prueba y las opciones configuradas.

a. Verificar la existencia de las VLAN correctas en todos los switches y la asignación de puertos troncales y de acceso

DLS1

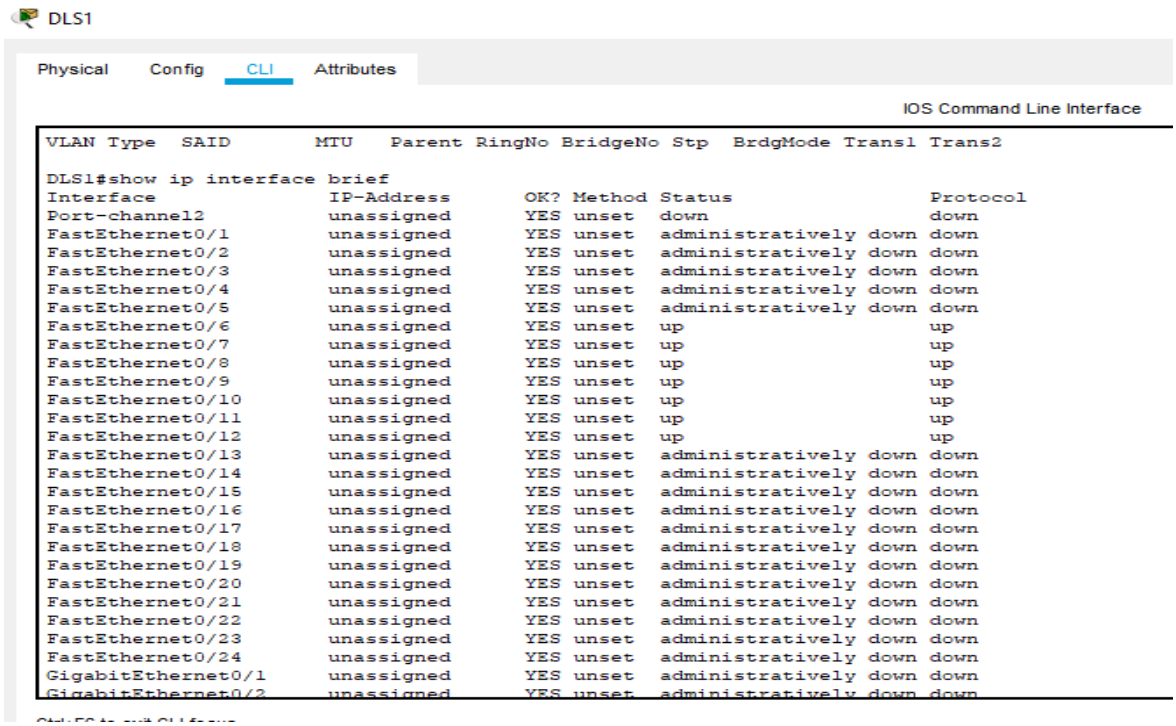
DLS1#show VLAN

Figura 57. Verificacion conectividad puertos de acceso a las VLANs



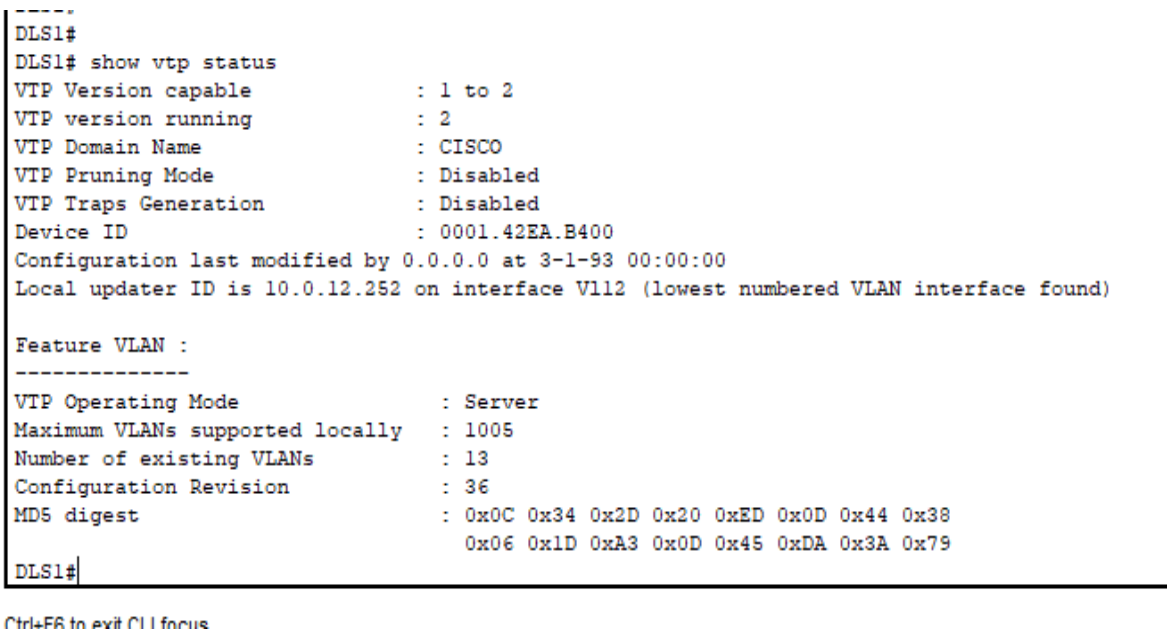
DLS1#show ip interface brief

Figura 58. Verificacion conectividad interfaces puertos de acceso a las VLANs



DLS1# show vtp status

Figura 59. Verificacion conectividad y estado de vtp en DLS1

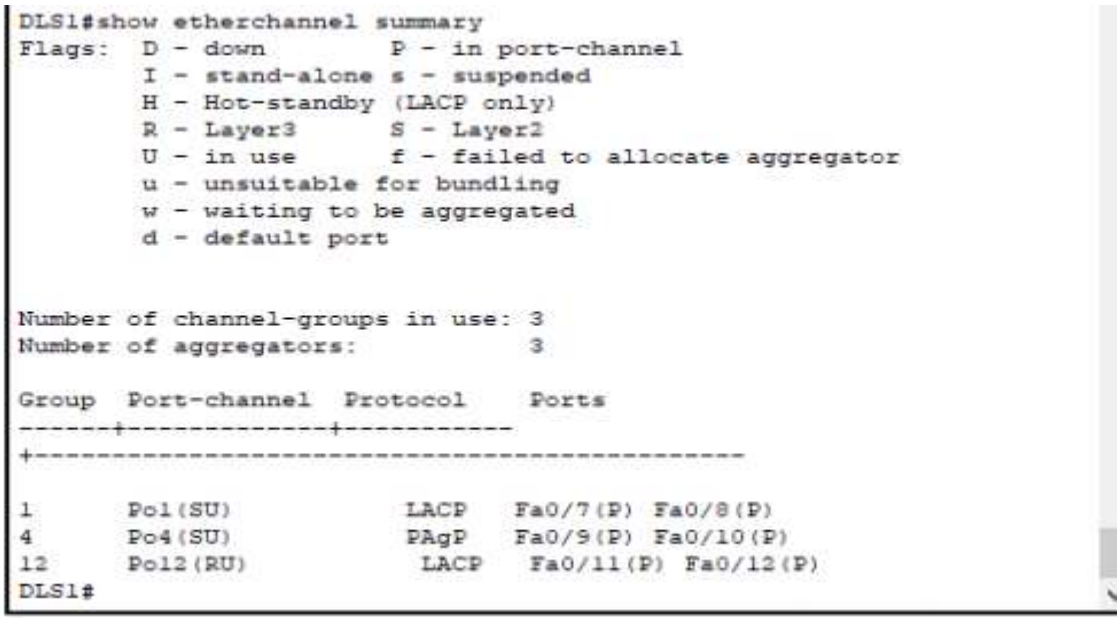


b. Verificar que el Ether-channels entre DLS1 y ALS1 está configurado correctamente.

DLS1

DLS1#show etherchannel summary

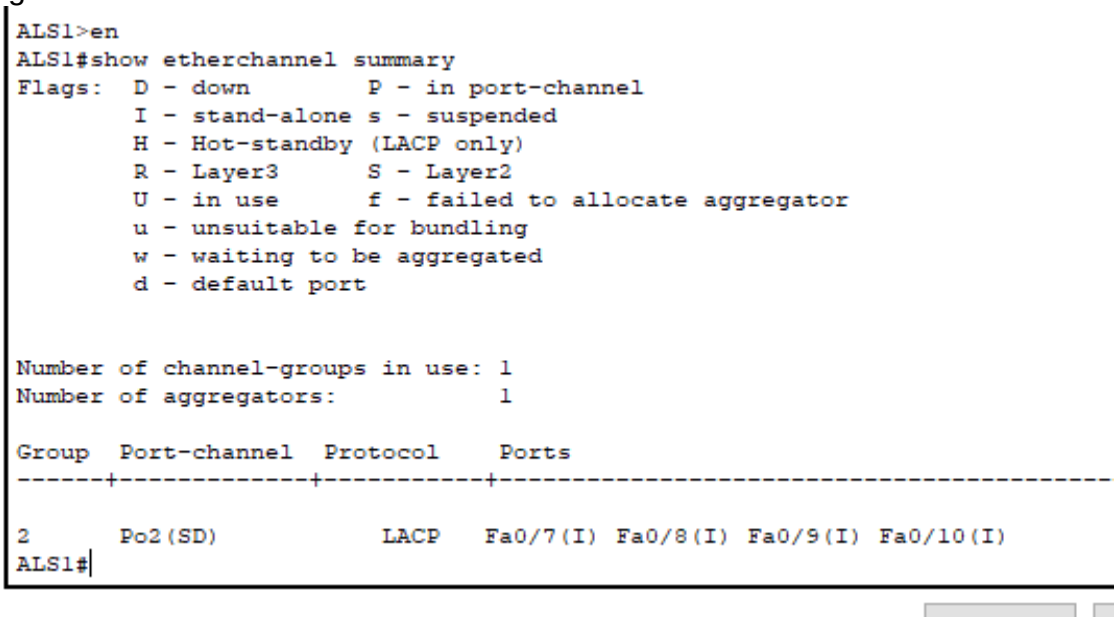
Figura 60. Verificacion conectividad canales en DLS1



ALS1

ALS1#show etherchannel summary

Figura 61. Verificacion conectividad canales en ALS1

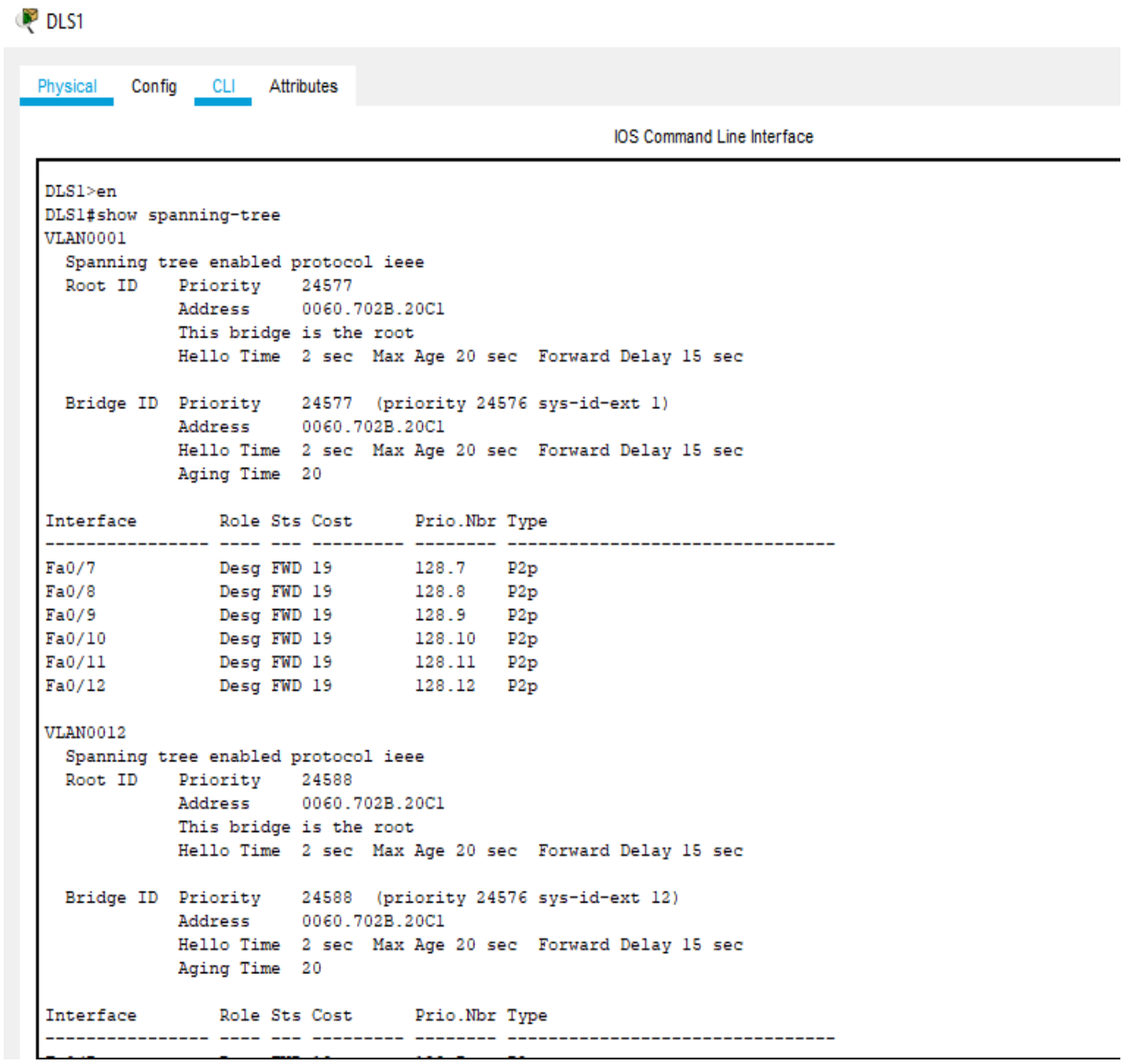


c. Verificar la configuración de Spanning tree entre DLS1 o DLS2 para cada VLAN**.**

DLS1

DLS1>en
DLS1#show spanning-tree
VLAN0001

Figura 62. Verificacion de la configuracion VLAN en DLS1



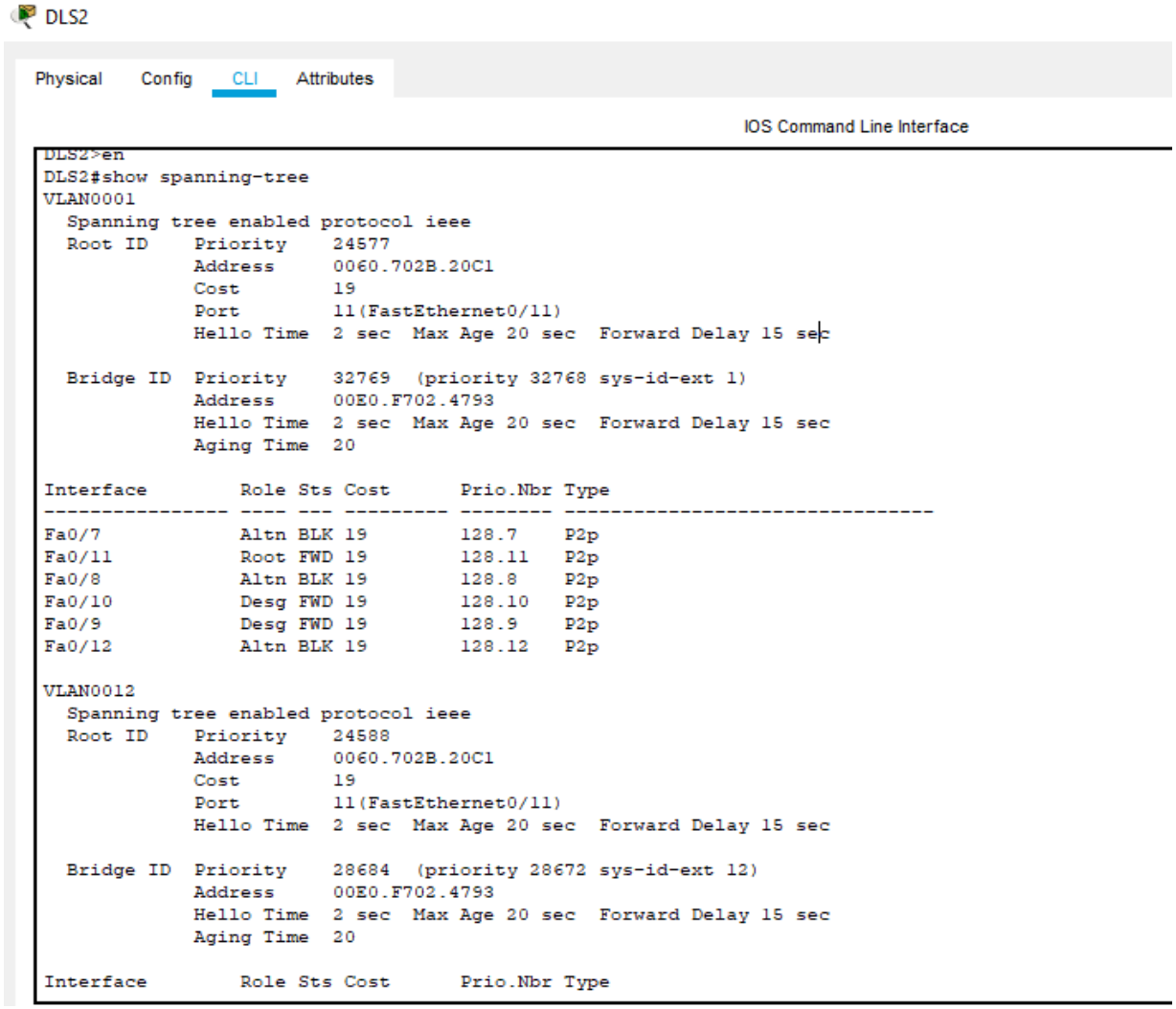
DLS2

DLS2>en

DLS2#show spanning-tree

VLAN0001

Figura 63. Verificacion de la configuracion VLAN en DLS2



CONCLUSIONES

Las configuraciones e interfaces de direcciones IP nos permiten implementar los protocolos de enrutamiento empleado en herramientas de simulación y laboratorios de acceso remoto con el fin de establecer el escenario planteado para analizar el comportamiento de los protocolos, que se usaron en los routers, mediante el uso de comandos de administración descritos en cada punto, como EIGRP, OSPF, ancho de banda uso de carga y demás características para cada lapso o distancia.

Se resalta las configuraciones iniciales y las comprobaciones de cada uno de los protocolos implementados, con el fin de conocer a groso modo lo fundamental de tener claro el ingreso de cada uno de los comandos para la configuración de cada red, verificando conexión y funcionamiento de la misma como se evidencia en el programa packet tracer en el desarrollo satisfactorio del primero escenario.

Mediante la implementación de los comandos consultados para cada configuración avanzada en los switches (con direccionamiento IPv4) se analizan los enlaces de protocolos de enrutamiento Ether-channels capa-3 utilizando LACP, acorde con el escenario establecido, realizando el diseño y configuración como se describe en los ítem solicitados del diagrama del segundo escenario consiguiendo la conexión esperada en el planteamiento como se evidencia en cada uno de los pasos realizados.

Adicional a esto es de resaltar y de tener en cuenta que a pesar de realizar cada uno de los pasos solicitados en la actividad, se tiene unas limitantes en el software packet tracer, debido a que por ser un servidor virtual se presentan algunas fallas al recibir algunos comandos, como por ejemplo los de OSPFv3 o VTPv3, al igual que la conectividad a internet para el laboratorio virtual, por lo que si no se tiene comunicación no permite el registro de las configuraciones realizadas, es por esto que se trabajó en packet tracer por ser una herramienta de mejor adecuación acorde al planteamiento realizado del escenario 2.

BIBLIOGRAFÍA

Froom, R., Frahim, E. (2015). CISCO Press (Ed). EIGRP Implementation. Implementing Cisco IP Switched Networks (SWITCH) Foundation Learning Guide CCNP SWITCH 300-115. Recuperado de https://1drv.ms/b/s!AmIJYei-NT1IlnWR0hoMxgBNv1CJ

Froom, R., Frahim, E. (2015). CISCO Press (Ed). High Availability. Implementing Cisco IP Switched Networks (SWITCH) Foundation Learning Guide CCNP SWITCH 300-115. Recuperado de https://1drv.ms/b/s!AmIJYei-NT1IlnWR0hoMxgBNv1CJ

Froom, R., Frahim, E. (2015). CISCO Press (Ed). Network Design Fundamentals. Implementing Cisco IP Switched Networks (SWITCH) Foundation Learning Guide CCNP SWITCH 300-115. Recuperado de https://1drv.ms/b/s!AmIJYei-NT1IlnWR0hoMxgBNv1CJ

Teare, D., Vachon B., Graziani, R. (2015). CISCO Press (Ed). EIGRP Implementation. Implementing Cisco IP Routing (ROUTE) Foundation Learning Guide CCNP ROUTE 300-101. Recuperado de https://1drv.ms/b/s!AmIJYei-NT1IlnMfy2rhPZHwEoWx

Teare, D., Vachon B., Graziani, R. (2015). CISCO Press (Ed). OSPF Implementation. Implementing Cisco IP Routing (ROUTE) Foundation Learning Guide CCNP ROUTE 300-101. Recuperado de https://1drv.ms/b/s!AmIJYei-NT1IlnMfy2rhPZHwEoWx

Teare, D., Vachon B., Graziani, R. (2015). CISCO Press (Ed). Implementing a Border Gateway Protocol (BGP). Implementing Cisco IP Routing (ROUTE) Foundation Learning Guide CCNP ROUTE 300-101. Recuperado de https://1drv.ms/b/s!AmIJYei-NT1IlnMfy2rhPZHwEoWx