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ESCENARIOS PRESENTES EN ENTORNOS CORPORATIVOS BAJO EL USO  
DE TECNOLOGÍA CISCO

PRUEBA DE HABILIDADES PRÁCTICAS CCNP

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD ESCUELA DE  
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ELECTRÓNICA

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2020

DIPLOMADO DE PROFUNDIZACION CISCO  
PRUEBA DE HABILIDADES PRÁCTICAS CCNP

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Electrónico

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ELECTRONICA

MEDELLIN

2020

NOTAS DE ACEPTACION

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Firma del Presidente del Jurado

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Firma del Jurado

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Firma del Jurado

Medellín, 26 de Noviembre de 2020

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## GLOSARIO

Protocolo Border Gateway Protocol (BGP por sus siglas en inglés): Protocolo mediante el cual se intercambia información de encaminamiento entre sistemas autónomos.

Protocolo de Enrutamiento de Puerta de enlace Interior Mejorado (en inglés, Enhanced Interior Gateway Routing Protocol o EIGRP): Protocolo de encaminamiento de vector distancia, propiedad de Cisco Systems, que ofrece lo mejor de los algoritmos de vector de distancia.

Protocolos de red: Conjunto de normas standard que especifican el método para enviar y recibir datos entre varios ordenadores. Es una convención que controla o permite la conexión, comunicación, y transferencia de datos entre dos puntos finales.

Protocolo Open Shortest Path First (OSPF por sus siglas en inglés): Protocolo de red para encaminamiento jerárquico de pasarela interior o Interior Gateway Protocol para calcular la ruta más corta entre dos nodos.

VLAN: Método para crear redes lógicas independientes dentro de una misma red física. Varias VLAN pueden coexistir en un único conmutador físico o en una única red física.

VTP: VLAN Trunking Protocol, un protocolo de mensajes de nivel 2 usado para configurar y administrar VLANs en equipos Cisco. Permite centralizar y simplificar la administración en un dominio de VLANs, pudiendo crear, borrar y renombrar las mismas, reduciendo así la necesidad de configurar la misma VLAN en todos los nodos.

## **RESUMEN**

El desarrollo de los escenarios presentes en entornos corporativos propuestos en este trabajo permite afianzar los conocimientos adquiridos en el diplomado de profundización CISCO CCNP.

Dichas soluciones son abordadas bajo los conceptos teóricos relacionados con protocolos de enrutamiento, conmutación y redes para dar así respuesta a las necesidades planteadas y evidenciar la implementación de la electrónica en diferentes aplicaciones.

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

## **ABSTRACT**

The development of the scenarios present in corporate environments proposed in this work allows to strengthen the knowledge acquired in the CISCO CCNP in-depth postgraduate.

Said solutions are approached under the theoretical concepts related to routing, switching and network protocols in order to respond to the needs raised and demonstrate the implementation of electronics in different applications.

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

## **INTRODUCCIÓN.**

Con el desarrollo práctico de los dos escenarios presentes en entornos corporativos propuestos se pretende evaluar los conocimientos adquiridos mediante el desarrollo del diplomado, permitiendo así, fortalecer el uso de diferentes comandos de configuración para el direccionamiento IPv4 y IPv6 bajo el uso de protocolos de enrutamiento.

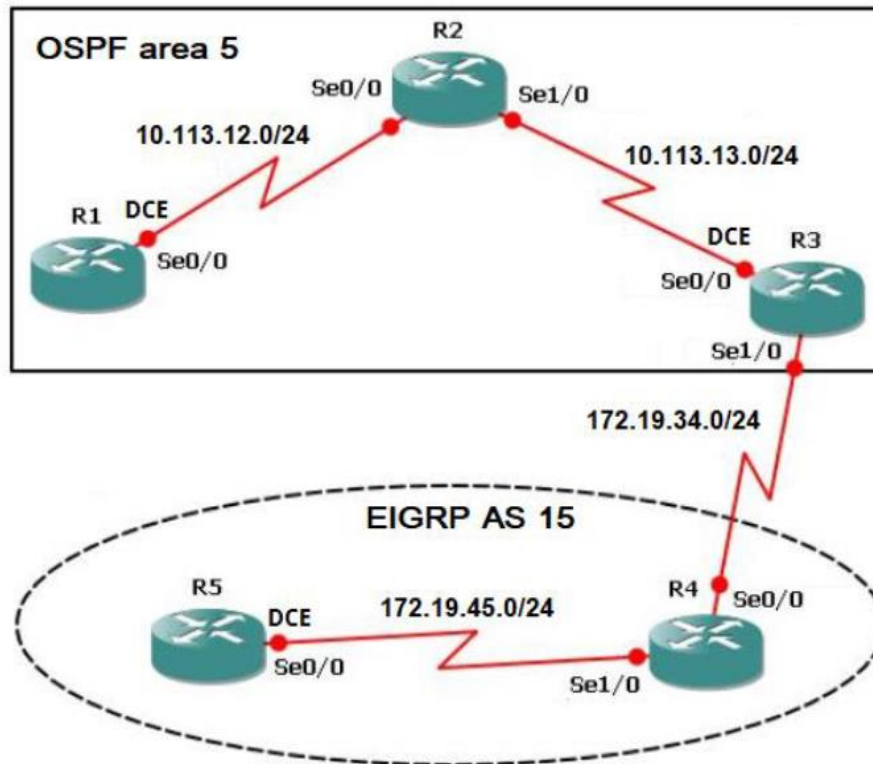
Para dar solución al escenario No. 1 planteado, se hace uso de diferentes simuladores que permiten el uso de comandos IOS de configuración avanzada en routers, con el fin de construir escenarios LAN/WAN que permitan la evaluación del funcionamiento de éstos, una vez aplicados comandos de administración y diferentes protocolos.

Respecto al escenario No. 2, se plantea la configuración de la red de acuerdo a las especificaciones establecidas para interconectar a su vez entre si, diferentes dispositivos a través de switches y los PC.

## DESARROLLO

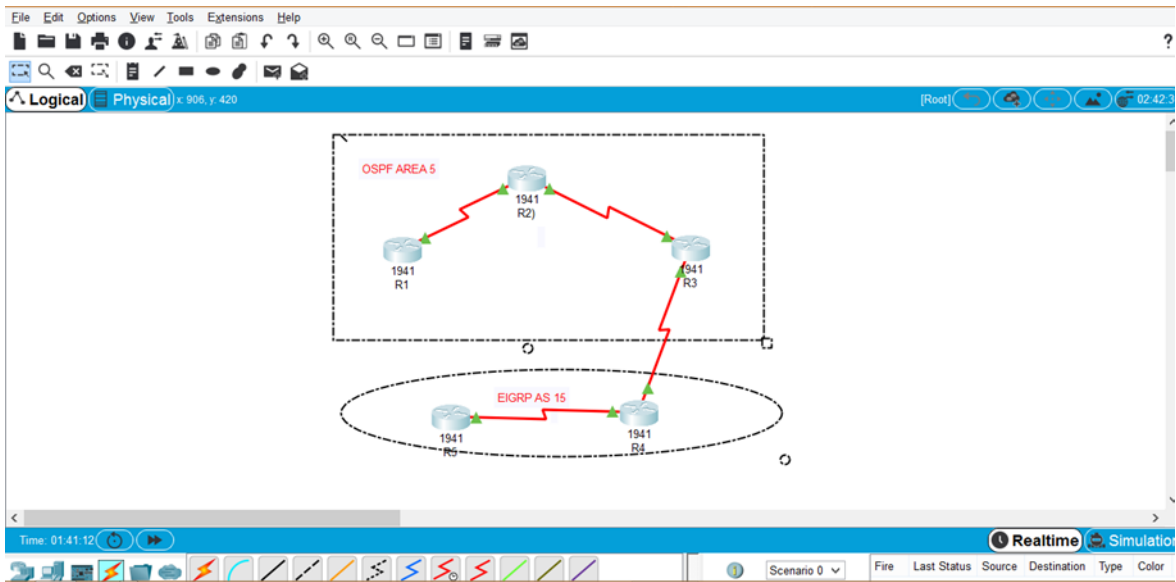
### 1. Escenario No. 1

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.

Figura 2 Escenario 1.



Configuración de interfaces para el router

R1

```
Router>enable
Router#configure t
Router(config)#hostname R1
R1(config)#interface s0/0/0
R1(config-if)#bandwidth 128000
R1(config-if)#ip address 10.113.12.10 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.113.12.0 0.0.0.255 area 5
R1(config-router)#exit
```

R2

```
Router>enable
Router#configure 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)#interface s0/0/1
R2(config-if)#ip address 10.113.13.20 255.255.255.0
R2(config-if)#no shutdown
```

```
R2(config-if)#exit
R2(config)#router ospf 1
R2(config-router)#network 10.113.13.0 0.0.0.255 area 5
R2(config-router)#network 10.113.13.1 0.0.0.255 area 5
R2(config-router)#exit
```

```
R3
Router>enable
Router#configure 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
R3(config-if)#interface s0/0/1
R3(config-if)#ip address 172.19.34.10 255.255.255.0
R3(config-if)#no shutdown
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
```

```
R4
Router>enable
Router#configure 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)#interface s0/0/1
R4(config-if)#ip address 172.19.45.20 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#exit
R4(config)#router eigrp 15
R4(config-router)#network 172.19.34.0 0.0.0.255
R4(config-router)#network 172.19.45.0 0.0.0.255
R4(config-router)#exit
```

```
R5
Router>enable
Router#configure 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)#exit
R5(config)#router eigrp 15
R5(config-router)#exit
```

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.

```
R1>enable
R1#configur t
R1(config)#interface loopback 0
R1(config-if)#ip address 10.1.0.10 255.255.255.0
R1(config-if)#interface loopback 1
R1(config-if)#ip address 10.1.1.10 255.255.255.0
R1(config-if)#interface loopback 2
R1(config-if)#ip address 10.1.2.10 255.255.255.0
R1(config-if)#interface loopback 3
R1(config-if)#ip address 10.1.3.10 255.255.255.0
R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.1.0.0 0.0.0.255 area 5
R1(config-router)#network 10.1.1.0 0.0.0.255 area 5
R1(config-router)#network 10.1.2.0 0.0.0.255 area 5
R1(config-router)#network 10.1.3.0 0.0.0.255 area 5
R1(config-router)#exit
R1(config)#end
```

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.

```
R5(config)#interface loopback 0
R5(config-if)#ip address 10.5.0.10 255.255.255.0
R5(config-if)#interface loopback 1
R5(config-if)#ip address 10.5.1.10 255.255.255.0
R5(config-if)#interface loopback 2
R5(config-if)#ip address 10.5.2.10 255.255.255.0
```

```

R5(config-if)#interface loopback 3
R5(config-if)#ip address 10.5.3.10 255.255.255.0
R5(config-if)#exit
R5(config)#router eigrp 15
R5(config-router)#exit

```

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.

Se aplica el show ip route en el R3 para validar:

Figura 3 Enrutamiento de R3

```

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

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
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, Serial0/0/1
L    172.19.34.10/32 is directly connected, Serial0/0/1
D    172.19.45.0/24 [90/2681856] via 172.19.34.20, 00:42:48, Serial0/0/1
R3>

```

R3 se encuentra aprendiendo nuevas interfaces de Loopback

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

```

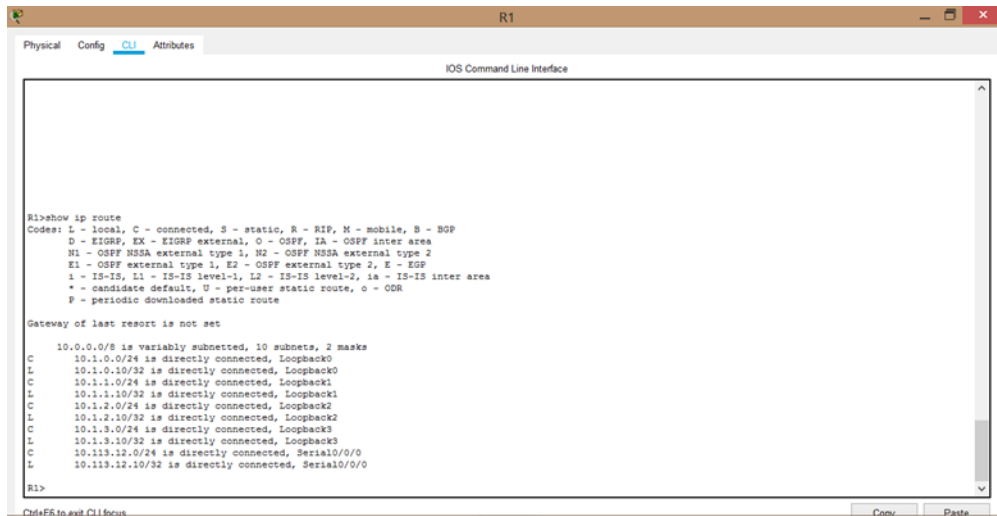
R3>enable
R3#configure t
R3(config)#router eigrp 15
R3(config-router)#redistribute ospf 1 metric 10000 100 255 1 1500
R3(config-router)#network 172.5.0.0 0.0.3.255
R3(config-router)#auto-summary
R3(config-router)#exit
R3(config)#router ospf 1
R3(config-router)#log-adjacency-changes
R3(config-router)#redistribute eigrp 15 subnets
R3(config-router)#network 10.1.0.0 0.0.3.255 area 5
R3(config-router)#exit

```

## R3(config)#

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 4 Verificación de R1



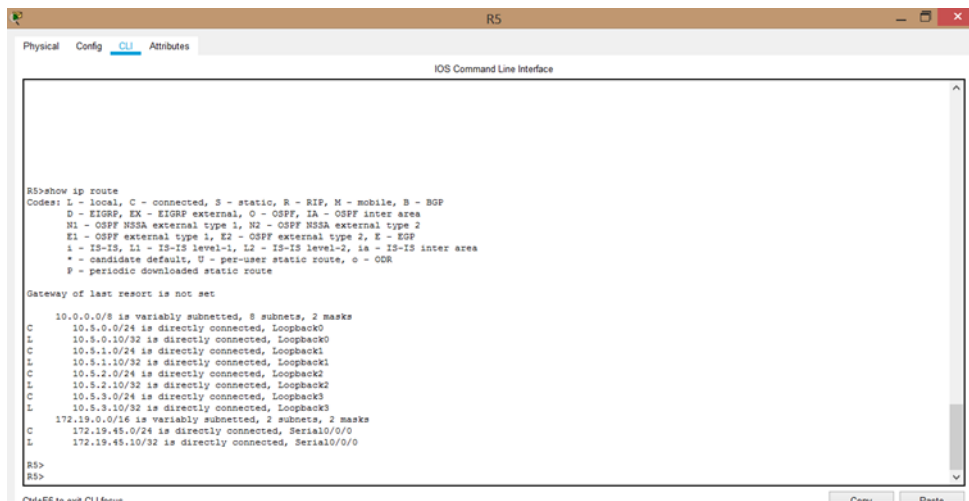
```
R1>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP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

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 10 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
C    10.113.12.0/24 is directly connected, Serial0/0/0
L    10.113.12.10/32 is directly connected, Serial0/0/0

R1>
```

Figura 5 Verificación de R4.



```
R5>show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       I - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C    10.5.0.0/24 is directly connected, Loopback0
L    10.5.0.10/32 is directly connected, Loopback0
C    10.5.1.0/24 is directly connected, Loopback1
L    10.5.1.10/32 is directly connected, Loopback1
C    10.5.2.0/24 is directly connected, Loopback2
L    10.5.2.10/32 is directly connected, Loopback2
C    10.5.3.0/24 is directly connected, Loopback3
L    10.5.3.10/32 is directly connected, Loopback3
C    172.19.0.0/24 is variably subnetted, 2 subnets, 2 masks
L    172.19.45.0/24 is directly connected, Serial0/0/0
L    172.19.45.10/32 is directly connected, Serial0/0/0

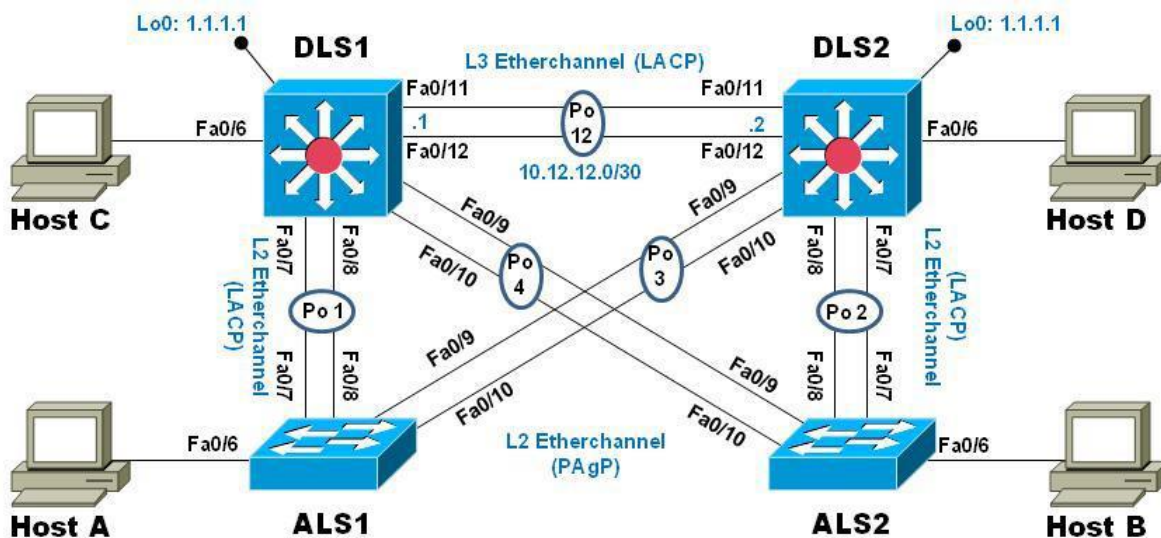
R5>
R5>
```

Se realiza la verificación en R1 y R5 mediante el comando show ip route y se verifica que estos routers contienen en su tabla de enrutamiento las interfaces configuradas

## 2. Escenario No. 2

Una empresa de comunicaciones presenta una estructura Core acorde a la topología de red, 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, etherchannels, VLANs y demás aspectos que forman parte del escenario propuesto.

Figura 6. Escenario 2



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

a. Apagar todas las interfaces en cada switch.

```
DLS1#enable
DLS1#configure terminal
DLS1(config)#interface range FastEthernet0/1-24, GigabitEthernet0/1-2
DLS1(config-if-range)#shutdown
DLS1(config-if-range)#exit
DLS1(config)#end
```

```
DLS2#enable
DLS2#configure terminal
DLS2(config)#interface range FastEthernet0/1-24, GigabitEthernet0/1-2
```

```
DLS2(config-if-range)#shutdown
DLS2(config-if-range)#exit
DLS2(config)#end
```

```
ALS1#enable
ALS1#configure terminal
ALS1(config)#interface range FastEthernet0/1-24, GigabitEthernet0/1-2
ALS1(config-if-range)#shutdown
ALS1(config-if-range)#exit
ALS1(config)#end
```

```
ALS2#enable
ALS2#configure terminal
ALS2(config)#interface range FastEthernet0/1-24, GigabitEthernet0/1-2
ALS2(config-if-range)#shutdown
ALS2(config-if-range)#exit
ALS2(config)#end
```

Se configuran los switch 3560 y 2960:

```
Switch>enable
Switch#delete flash:vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
%Error deleting flash:/vlan.dat (No such file or directory)
```

```
Switch#delete flash:multiple-fs
Delete filename [multiple-fs]?
Delete flash:/multiple-fs? [confirm]
%Error deleting flash:/multiple-fs (No such file or directory)
```

```
Switch#erase startup-config
Erasing the nvram filesystem will remove all configuration files! Continue? [confirm]
[OK]
Erase of nvram: complete
Switch#configure terminal
Switch(config)#sdm prefer dual-ipv4-and-ipv6 routing
Switch(config)#exit
Switch#reload
```

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

```
Switch>enable
Switch#configure terminal
Switch(config)#Hostname DLS1
DLS1(config)#exit
```

```

Switch>enable
Switch#configure terminal
Switch(config)#Hostname DLS2
DLS1(config)#exit

```

```

Switch>enable
Switch#configure terminal
Switch(config)#Hostname ALS1
DLS1(config)#exit

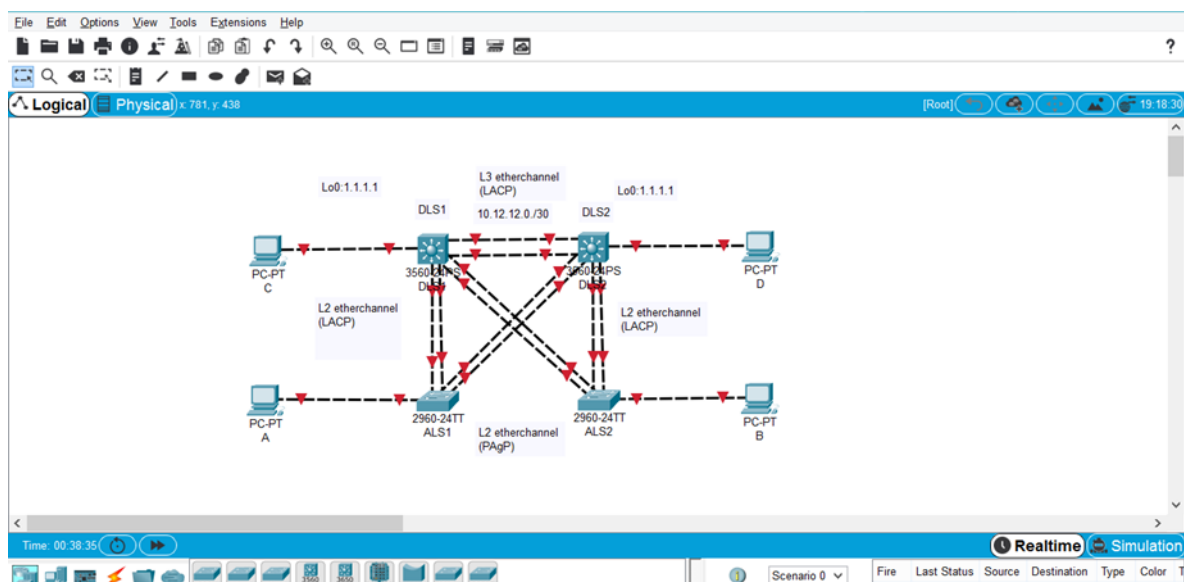
```

```

Switch>enable
Switch#configure terminal
Switch(config)#Hostname DLS2
DLS1(config)#exit

```

Figura 7. Configuración escenario 2.



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

```

DLS1>en
DLS1#conf ter
DLS1(config)#interface range fa0/11-12
DLS1(config-if-range)#channel-group 12 mode active
DLS1(config-if-range)#no shut

```

```

DLS2>en
DLS2#conf ter
DLS2(config)#interface range fa0/11-12

```

```
DLS2(config-if-range)#channel-group 12 mode active
DLS2(config-if-range)#no shut
```

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

configuracion LACP

```
DLS1>en
DLS1#conf ter
DLS1(config)#interface range fa0/7-8
DLS1(config-if-range)#channel-group 1 mode active
DLS1(config-if-range)#no shut
```

```
ALS1>en
ALS1#conf ter
ALS1(config)#interface range fa0/7-8
ALS1(config-if-range)#channel-group 1 mode active
ALS1(config-if-range)#no shut
```

```
DLS2>en
DLS2#conf ter
DLS2(config)#interface range fa0/7-8
DLS2(config-if-range)#channel-group 2 mode active
DLS2(config-if-range)#no shut
```

```
ALS2>en
ALS2#conf ter
ALS2(config)#interface range fa0/7-8
ALS2(config-if-range)#channel-group 2 mode active
ALS2(config-if-range)#no shut
```

1) La conexión entre DLS1 y DLS2 será un EtherChannel 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.

```
DLS1>enable
DLS1#config t
DLS1(config)#interface port-channel 12
DLS1(config-if)#no switchport
DLS1(config-if)#ip address 10.12.12.1 255.255.255.252
DLS1(config-if)#exit
DLS1(config)#interface range fa0/11-12
DLS1(config-if-range)#no switchport
DLS1(config-if-range)#exit
DLS1(config)#end
```

## DLS2

```
DLS2>enable
```

```
DLS2#config t
```

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

```
DLS2(config)#interface port-channel 12
```

```
DLS2(config-if)#no switchport
```

```
DLS2(config-if)#ip address 10.12.12.2 255.255.255.252
```

```
DLS2(config-if)#exit
```

```
DLS2(config)#interface range fa0/11-12
```

```
DLS2(config-if-range)#no switchport
```

```
DLS2(config-if-range)#channel-group 12 mode active
```

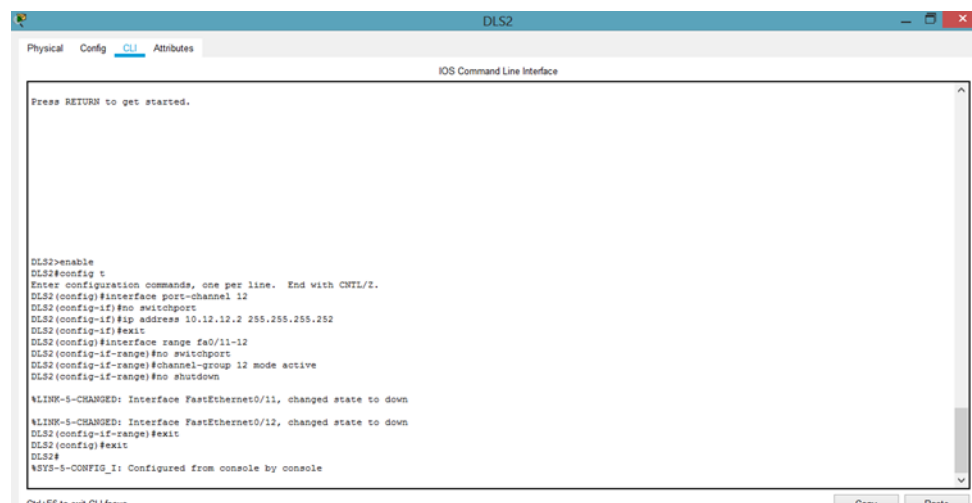
```
DLS2(config-if-range)#no shutdown
```

```
DLS2(config-if-range)#exit
```

```
DLS2(config)#exit
```

```
DLS2#
```

Figura 8. Configuración DLS2



```
DLS2
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started.

DLS2>enable
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface port-channel 12
DLS2(config-if)#no switchport
DLS2(config-if)#ip address 10.12.12.2 255.255.255.252
DLS2(config-if)#exit
DLS2(config)#interface range fa0/11-12
DLS2(config-if-range)#no switchport
DLS2(config-if-range)#channel-group 12 mode active
DLS2(config-if-range)#no shutdown
DLS2(config-if-range)#exit
DLS2(config)#exit
DLS2#
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to down
DLS2(config-if-range)#exit
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
DataFR to avit f11 focus
```

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

```
DLS1>enable
```

```
DLS1#config t
```

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

```
DLS1(config)#interface range fa0/7-8
```

```
DLS1(config-if-range)#switchport trunk encapsulation dot1q
```

```
DLS1(config-if-range)#switchport mode trunk
```

```
DLS1(config-if-range)#channel-group 1 mode active
```

```
DLS1(config-if-range)#
```

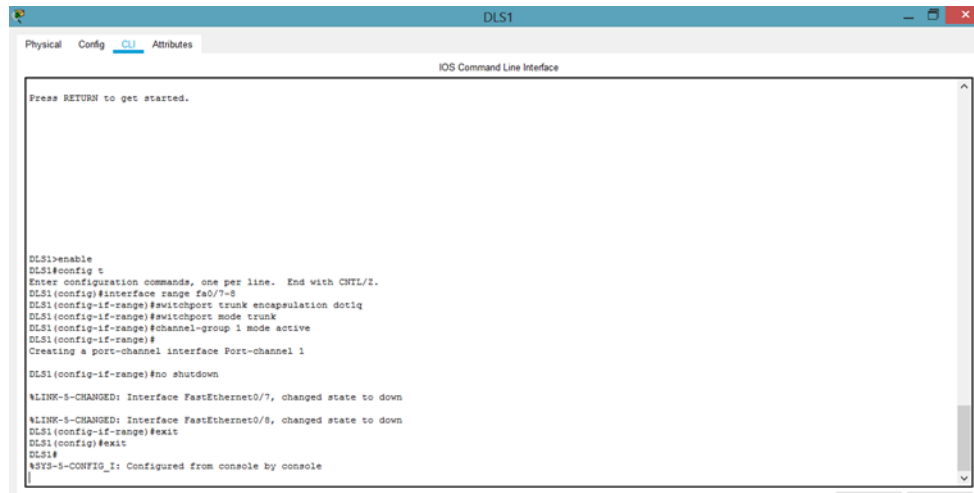
Creating a port-channel interface Port-channel 1

```
DLS1(config-if-range)#no shutdown
```

```
DLS1(config-if-range)#exit
```

DLS1(config)#exit

Figura 9. Configuración DLS1 en las interfaces Fa0/7 y Fa0/8.



```
DLS1>enable
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface range fa0/7-8
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#channel-group 1 mode active
DLS1(config-if-range)#
Creating a port-channel interface Port-channel 1
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)#exit
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

## DLS2

DLS2>ENABLE

DLS2#config t

DLS2(config)#interface range fa0/7-8

DLS2(config-if-range)#switchport trunk encapsulation dot1q

DLS2(config-if-range)#switchport mode trunk

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)#exit

DLS2(config)#exit

DLS2#

Figura 10. Visualización de configuración DLS2 .

```

DLS2
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started.

DLS2>ENABLE
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface range fa0/7-8
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#switchport mode trunk
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
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
DLS2(config-if-range)#exit
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
  
```

Figura 11. Ajustes DLS2.

```

DLS2
Physical Config CLI Attributes
IOS Command Line Interface

DLS2#show etherchannel summary
Flags: D - down F - in port-channel
I - stand-alone # - suspended
H - Hot-standby (LACP only)
R - Layer3 S - Layer2
U - in use # - failed to allocate aggregator
u - unsuitable for bundling
w - waiting to be aggregated
d - default port

Number of channel-groups in use: 3
Number of aggregators: 3

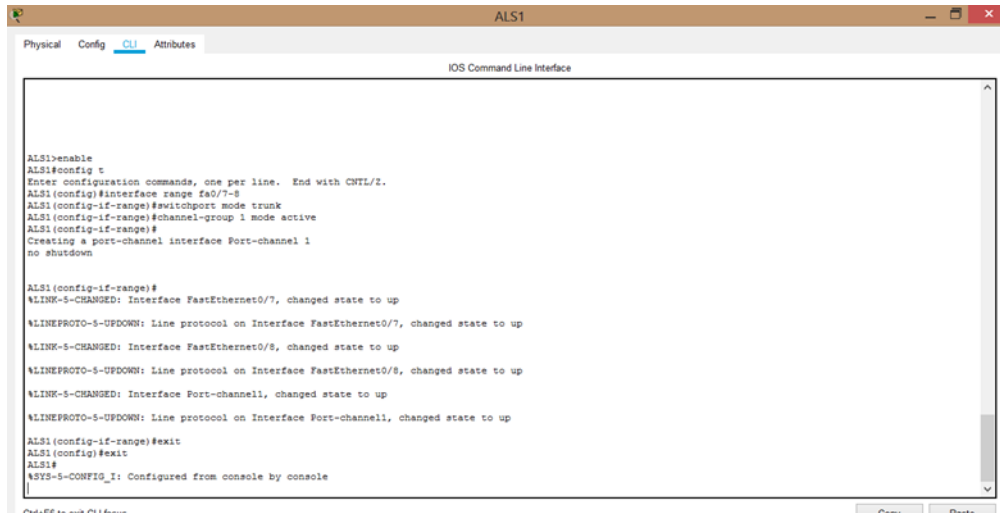
Group Port-channel Protocol Ports
-----
2 Po2(SD) LACP Fa0/7(F) Fa0/8(F)
3 Po3(SD) HgP Fa0/9(D) Fa0/10(F)
12 Po12(RD) LACP Fa0/11(D) Fa0/12(D)
DLS2#
  
```

**ALS1**

```

ALS1>enable
ALS1#config t
ALS1(config)#interface range fa0/7-8
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#channel-group 1 mode active
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 1
ALS1(config-if-range)#no shutdown
ALS1(config-if-range)#exit
ALS1(config)#exit
  
```

Figura 12. Configuración ALS1.

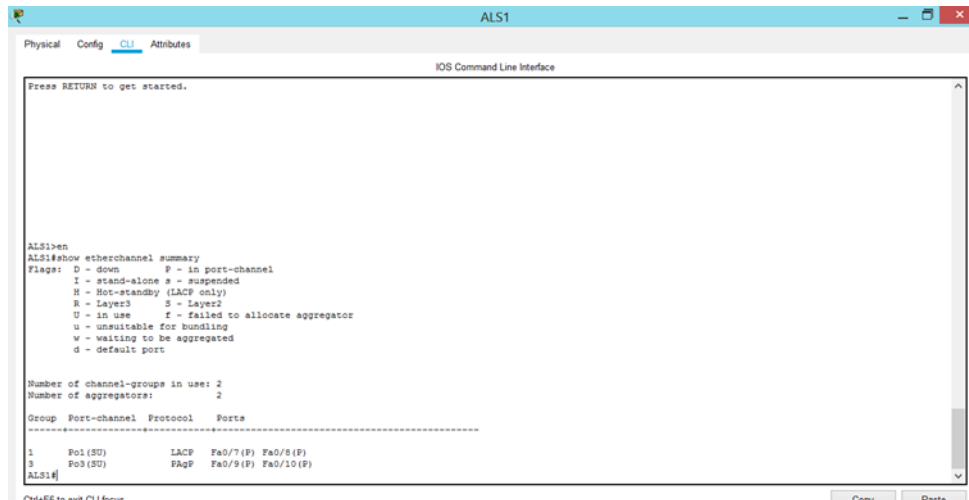


```
ALS1>enable
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface range fa0/7-8
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#channel-group 1 mode active
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 1
no shutdown

ALS1(config-if-range)#
%LINK-S-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-S-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-S-CHANGED: Interface FastEthernet0/8, changed state to up
%LINEPROTO-S-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINK-S-CHANGED: Interface Port-channel1, changed state to up
%LINEPROTO-S-UPDOWN: Line protocol on Interface Port-channel1, changed state to up

ALS1(config-if-range)#exit
ALS1(config)#exit
ALS1#
%SYS-S-CONFIG_I: Configured from console by console
ALS1#
```

Figura 13. Visualización ajustes ALS1.



```
ALS1#show etherchannel summary
Flags: D - down        P - in port-channel
       I - stand-alone s - suspended
       H - Hot-standby (LACP only)
       R - Layer3       S - Layer2
       U - in use       f - failed to allocate aggregator
       u - unsuitable for bundling
       w - waiting to be aggregated
       d - default port

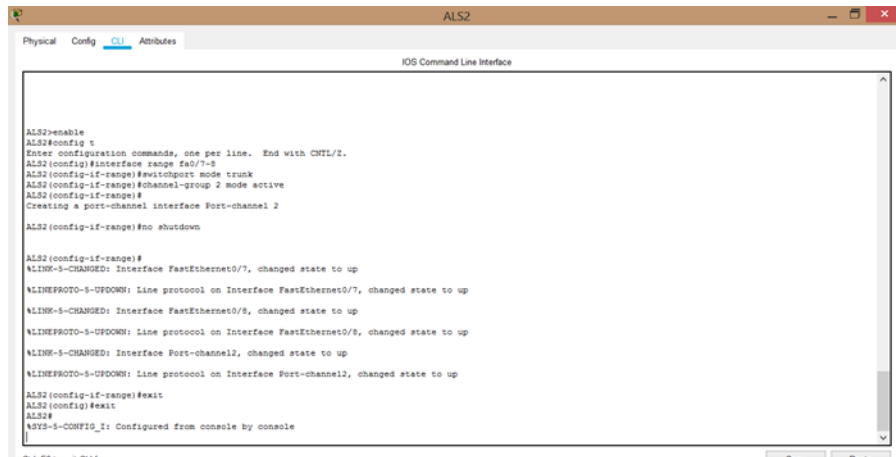
Number of channel-groups in use: 2
Number of aggregators:          2

Group  Port-channel  Protocol  Ports
-----
1      Po1(SU)          LACP     Fa0/7(F) Fa0/8(F)
3      Po3(SU)          PAgP     Fa0/9(F) Fa0/10(F)
ALS1#
```

## ALS2

```
ALS2>enable
ALS2#config t
ALS2(config)#interface range fa0/7-8
ALS2(config-if-range)#switchport mode trunk
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)#exit
ALS2(config)#exit
```

Figura 14. Configuración ALS2.

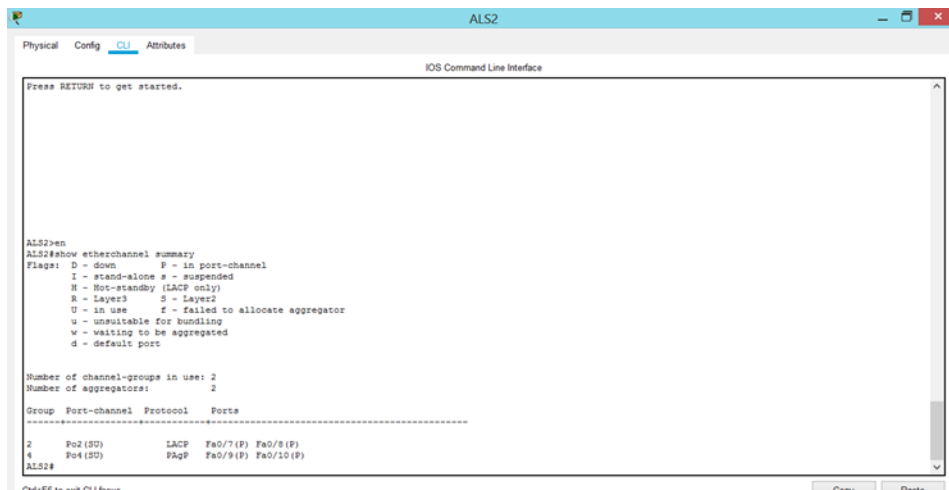


```
ALS2>enable
ALS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface range fa0/7-8
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#channel-group 2 mode active
ALS2(config-if-range)#
Creating a port-channel interface Port-channel 2
ALS2(config-if-range)#no shutdown

ALS2(config-if-range)#
%LINK-3-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-3-CHANGED: Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
%LINK-3-CHANGED: Interface Port-channel2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to up

ALS2(config-if-range)#exit
ALS2(config)#exit
ALS2#
SYS-3-CONFIG_1: Configured from console by console
```

Figura 15. Visualización ajustes ALS2.



```
ALS2>en
ALS2#show etherchannel summary
Flags: D - down        F - in port-channel
       I - stand-alone s - suspended
       H - Hot-standby (LACP only)
       R - Layer3      S - Layer2
       U - in use      s - failed to allocate aggregator
       u - unusable for bundling
       W - waiting to be aggregated
       d - default port

Number of channel-groups in use: 2
Number of aggregators:          2

-----
Group Port-channel Protocol Ports
-----
2      Po2(SU)        LACP Fa0/7(F) Fa0/8(F)
4      Po4(SU)        PAgP Fa0/9(F) Fa0/10(F)
ALS2#
```

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

**DLS1>**

DLS1>enable

DLS1#configure t

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

DLS1(config)#interface range fa0/9-10

DLS1(config-if-range)#switchport trunk encapsulation dot1q

DLS1(config-if-range)#switchport mode trunk

DLS1(config-if-range)#channel-group 4 mode desirable

DLS1(config-if-range)#

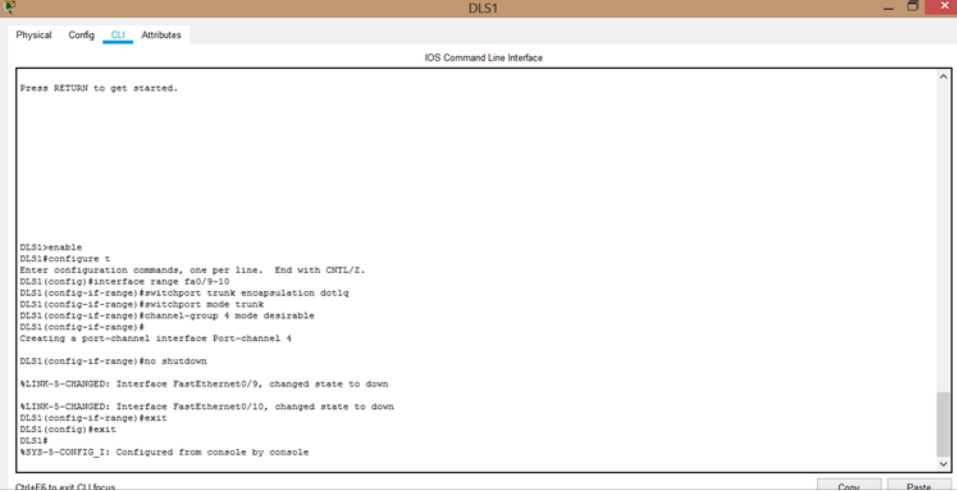
Creating a port-channel interface Port-channel 4

DLS1(config-if-range)#no shutdown

DLS1(config-if-range)#exit

```
DLS1(config)#exit
DLS1#
```

Figura 16. Configuración DLS1 en las interfaces F0/9 y fa0/10 .



```
DLS1
Physical Config CLI Attributes
IOS Command Line Interface

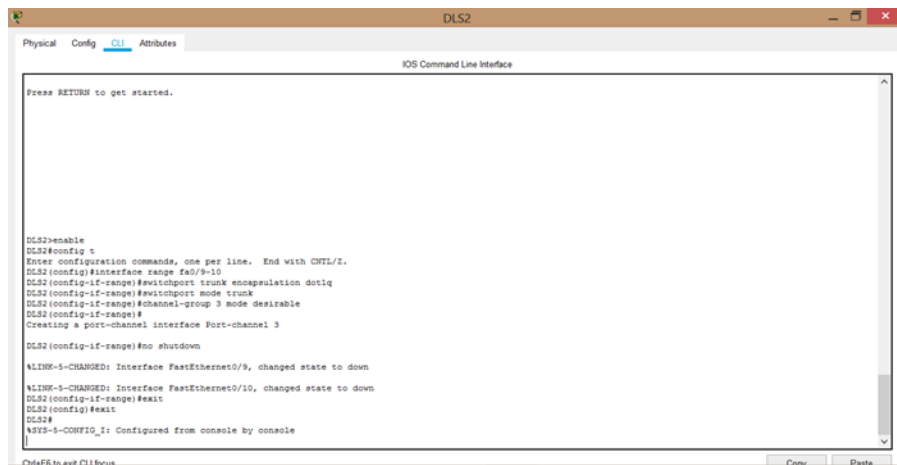
Press RETURN to get started.

DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface range fa0/9-10
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#channel-group 4 mode desirable
DLS1(config-if-range)#
Creating a port-channel interface Port-channel 4
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)#exit
DLS1(config)#exit
DLS1#
SYS-5-CONFIG_I: Configured from console by console
```

## DLS2

```
DLS2>enable
DLS2#config t
DLS2(config)#interface range fa0/9-10
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#channel-group 3 mode desirable
DLS2(config-if-range)#
Creating a port-channel interface Port-channel 3
DLS2(config-if-range)#no shutdown
DLS2(config-if-range)#exit
DLS2(config)#exit
DLS2#
```

Figura 17. Configuración DLS2 en las interfaces F0/9 y fa0/10.



```
DLS2>enable
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface range fa0/9-10
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#channel-group 3 mode desirable
DLS2(config-if-range)#
Creating a port-channel interface Port-channel 3
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)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
```

### ALS1

ALS1>enable

ALS1#config t

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

ALS1(config)#interface range fa0/9-10

ALS1(config-if-range)#switchport trunk encapsulation dot1q

ALS1(config-if-range)#switchport mode trunk

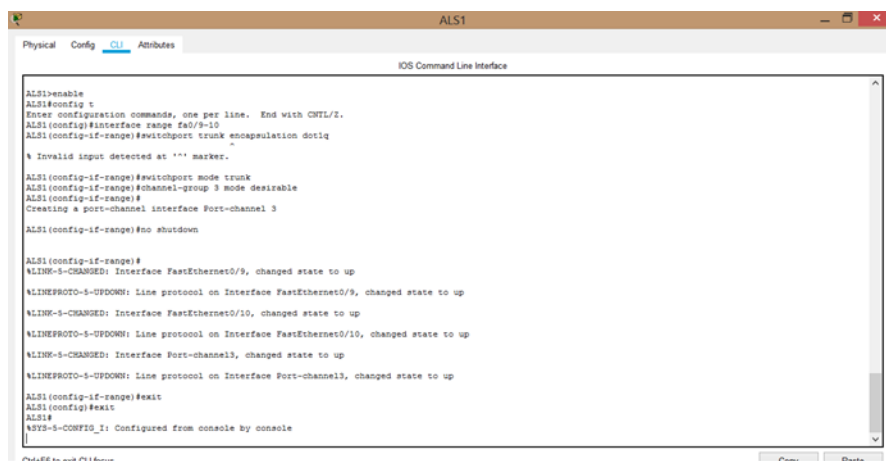
ALS1(config-if-range)#channel-group 3 mode desirable

ALS1(config-if-range)#no shutdown

ALS1(config-if-range)#exit

ALS1(config)#exit

Figura 18. Visualización ajustes ALS1.



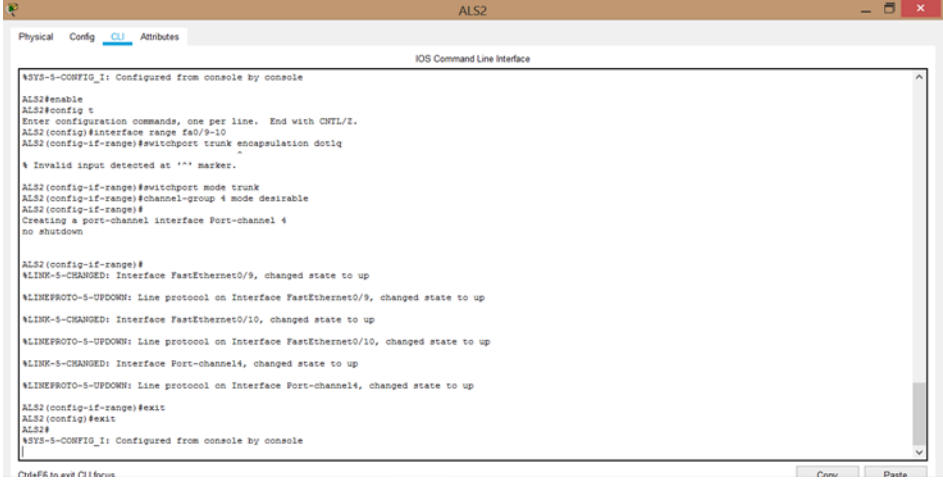
```
ALS1>enable
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface range fa0/9-10
ALS1(config-if-range)#switchport trunk encapsulation dot1q
% Invalid input detected at '''' marker.
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#channel-group 3 mode desirable
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 3
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
%LINK-5-CHANGED: Interface Port-channel3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel3, changed state to up
ALS1(config-if-range)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console
```

Nota: el comando switchport trunk encapsulation dot1q para el switch 2960, no está soportado

## ALS2

```
ALS2>enable
ALS2#config t
ALS2(config)#interface range fa0/9-10
ALS2(config-if-range)#switchport trunk encapsulation dot1q
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#channel-group 4 mode desirable
ALS2(config-if-range)#no shutdown
ALS2(config-if-range)#exit
ALS2(config)#exit
```

Figura 19. Configuración ALS2 en las interfaces F0/9 y fa0/10.



```
Physical Config CLI Attributes
IOS Command Line Interface
#SYS-5-CONFIG_I: Configured from console by console
ALS2#enable
ALS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface range fa0/9-10
ALS2(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#channel-group 4 mode desirable
ALS2(config-if-range)#
Creating a port-channel interface Port-channel 4
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
%LINK-5-CHANGED: Interface Port-channel4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel4, changed state to up
ALS2(config-if-range)#exit
ALS2(config)#exit
#SYS-5-CONFIG_I: Configured from console by console
|
```

Nota: el comando switchport trunk encapsulation dot1q para el switch 2960 no esta soportado

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

## DLS1

```
DLS1>enable
DLS1#config t
DLS1(config)#interface po1
DLS1(config-if)#switchport trunk native vlan 500
DLS1(config-if)#exit
DLS1(config)#interface po4
DLS1(config-if)#switchport trunk native vlan 500
DLS1(config-if)#exit
DLS1(config)#exit
```

Figura 20. Configuración DLS1 VLAN 500.

```
DLS1
Physical Config CLI Attributes
IOS Command Line Interface
DLS1(config)#interface po1
DLS1(config-if)#switchport trunk native vlan 500
DLS1(config-if)#exit
DLS1(config)#
%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 FastEthernet0/7 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ALS1 FastEthernet0/8 (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 FastEthernet0/7 (500), with ALS1 Port-channel1 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ALS1 Port-channel1 (1).
DLS1(config)#interface po4
DLS1(config-if)#switchport trunk native vlan 500
DLS1(config-if)#exit
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
%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 FastEthernet0/9 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS2 FastEthernet0/10 (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 FastEthernet0/9 (500), with ALS2 Port-channel4 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ALS2 Port-channel4 (1).
DLS1#
```

Figura 21. Ajuste configuración DLS1 VLAN 500.

```
DLS1
Physical Config CLI Attributes
IOS Command Line Interface
Press RETURN to get started.
DLS1>en
DLS1#show interface trunk
Port      Mode      Encapsulation  Status      Native vlan
Po1       on        802.1q         trunking    500
Po4       on        802.1q         trunking    500
Port      Vlans allowed on trunk
Po1       1-1005
Po4       1-1005
Port      Vlans allowed and active in management domain
Po1       1,12,234,500
Po4       1,12,234,500
Port      Vlans in spanning tree forwarding state and not pruned
Po1       1,12,234,500
Po4       1,12,234,500
DLS1#
```

## DLS2

DLS2>enable

DLS2#config t

DLS2(config)#interface po2

DLS2(config-if)#switchport trunk native vlan 500

DLS2(config-if)#exit

DLS2(config-if)#interface po3

DLS2(config-if)#switchport trunk native vlan 500

DLS2(config-if)#exit

DLS2(config)#end DLS2#

Figura 22. Configuración DLS2 VLAN 500.

```

DLS2
Physical Config CLI Attributes
IOS Command Line Interface
DLS2 (config)#interface po2
DLS2 (config-if)#switchport trunk native vlan 500
DLS2 (config-if)#exit
DLS2 (config)#interface po3
DLS2 (config-if)#
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ALS2 FastEthernet0/7 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ALS2 FastEthernet0/7 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ALS2 FastEthernet0/8 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS2 FastEthernet0/8 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ALS2 Port-channel2 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ALS2 Port-channel2 (1).
DLS2 (config-if)#switchport trunk native vlan 500
DLS2 (config-if)#exit
DLS2 (config)#end
DLS2#
RSP-3-CONFIG_I: Configured from console by console
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS1 FastEthernet0/9 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ALS1 FastEthernet0/9 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS1 FastEthernet0/10 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ALS1 FastEthernet0/10 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ALS1 Port-channel3 (1).
VCDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ALS1 Port-channel3 (1).
DLS2#
  
```

Figura 23. Ajuste configuración DLS2 VLAN 500.

```

DLS2
Physical Config CLI Attributes
IOS Command Line Interface
Press RETURN to get started.

DLS2#en
DLS2#show interface trunk
Port      Mode      Encapsulation  Status        Native vlan
Po2       on        802.1q         trunking     500
Po3       on        802.1q         trunking     500

Port      Vlans allowed on trunk
Po2       1-1005
Po3       1-1005

Port      Vlans allowed and active in management domain
Po2       1
Po3       1

Port      Vlans in spanning tree forwarding state and not pruned
Po2       none
Po3       1

DLS2#
  
```

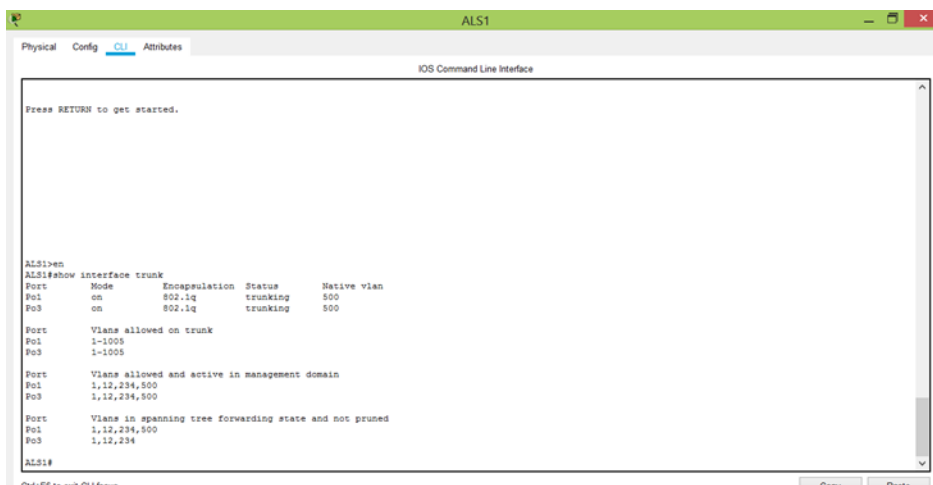
```

ALS1
ALS1>
ALS1>enable
ALS1#config t
ALS1(config)#interface po1
ALS1(config-if)#switchport trunk native vlan 500
ALS1(config-if)#exit
ALS1(config)#interface po3
ALS1(config-if)#switchport trunk native vlan 500
ALS1(config-if)#exit
ALS1(config)#end ALS1#
  
```

Figura 24. Configuración ALS1 VLAN 500.



Figura 25. Ajuste configuración ALS1 VLAN 500.



## ALS2

ALS2>enable

ALS2#config t

ALS2(config)#interface po2

ALS2(config-if)#switchport trunk native vlan 500

ALS2(config-if)#exit

ALS2(config)#interface po4

ALS2(config-if)#switchport trunk native vlan 500

ALS2(config-if)#exit

ALS2#

Figura 26. Configuración ALS2 VLAN 500.

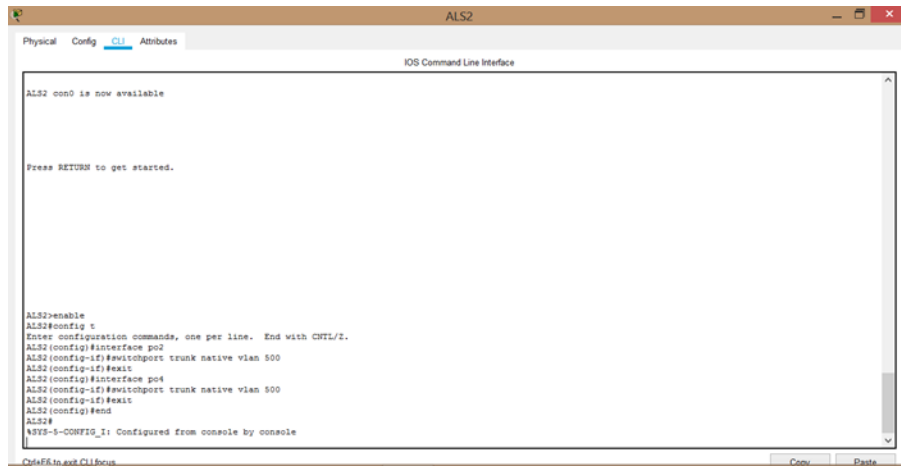
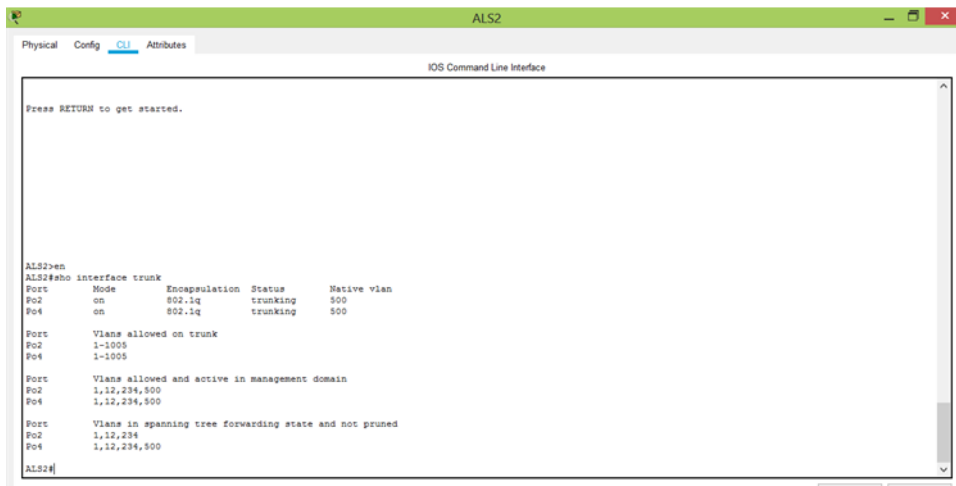


Figura 27. Ajuste configuración ALS2 VLAN 500.



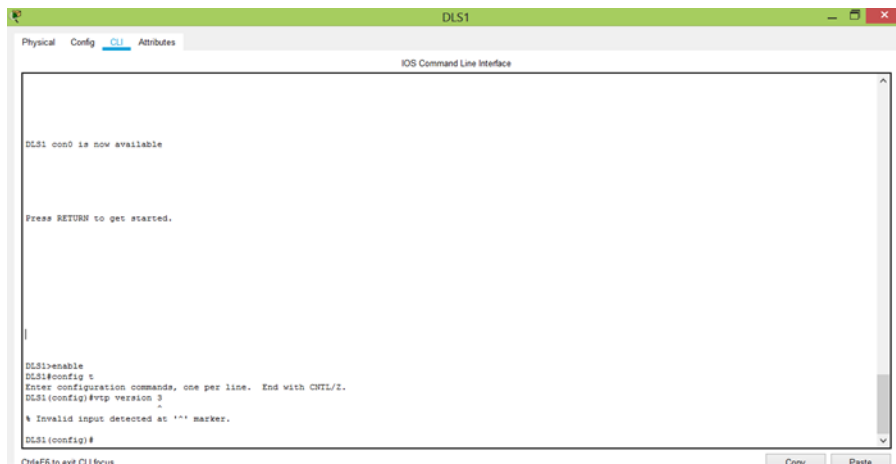
Figura 28. Distribución ALS2 VLAN 500.



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

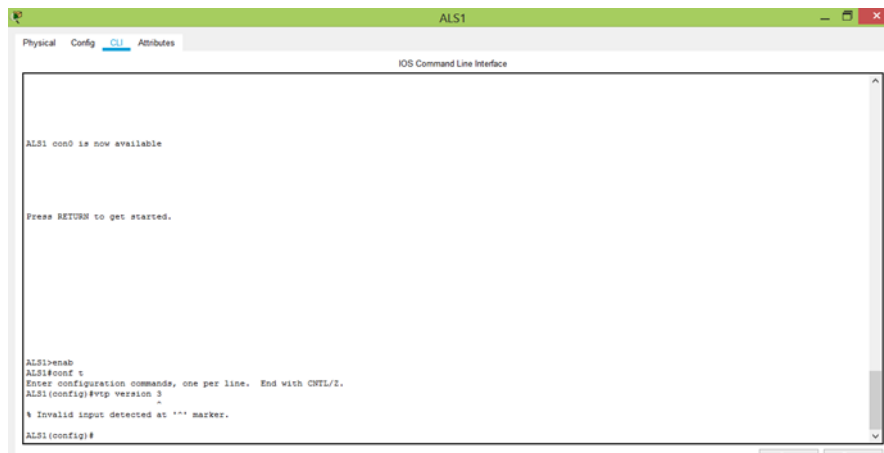
```
DLS1>enable
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#vtp version 3
^
% Invalid input detected at '^' marker.
DLS1(config)#
```

Figura 29. Configuración DLS1 VTP.



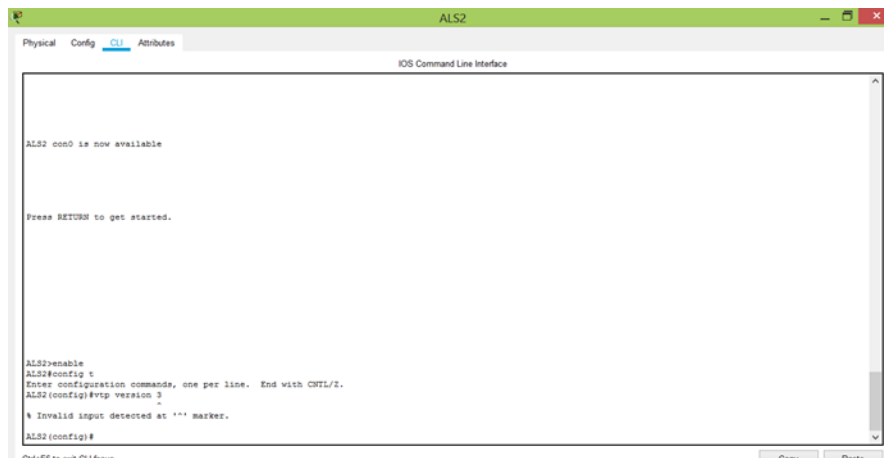
```
ALS1>enable
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#vtp version 3
^
% Invalid input detected at '^' marker.
ALS1(config)#
```

Figura 30. Ajuste configuración ALS1 VTP.



```
ALS2>enable
ALS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#vtp version 3
^
% Invalid input detected at '^' marker.
ALS2(config)#
```

Figura 31. Configuración ALS2 VTP.



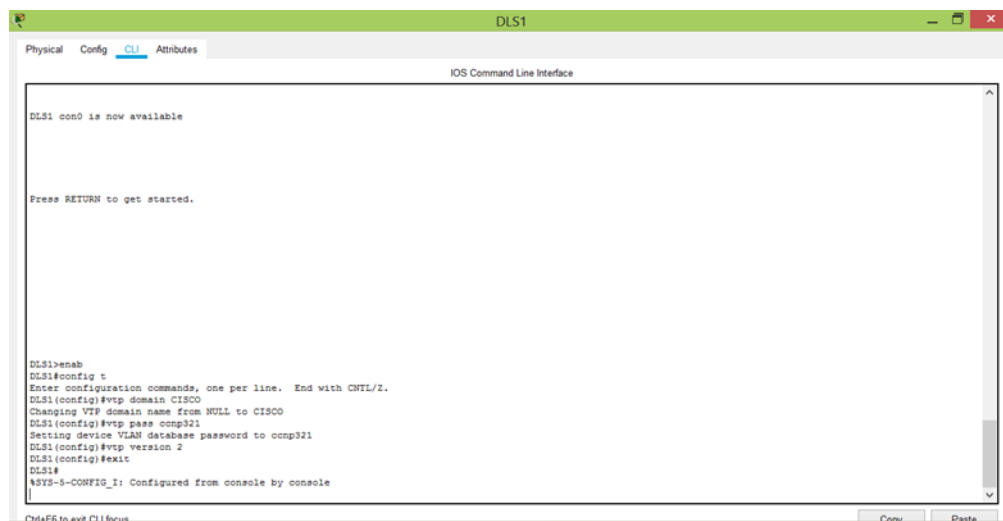
Comando solo es posible configurar la versión 2

- 1) Utilizar el nombre de dominio CISCO con la contraseña ccnp321
- 2) Configurar DLS1 como servidor principal para las VLAN.
- 3) Configurar ALS1 y ALS2 como clientes VTP.

## DLS1

```
DLS1>enab
DLS1#config t
DLS1(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
DLS1(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
DLS1(config)#vtp version 2
DLS1(config)# exit
DLS1#
```

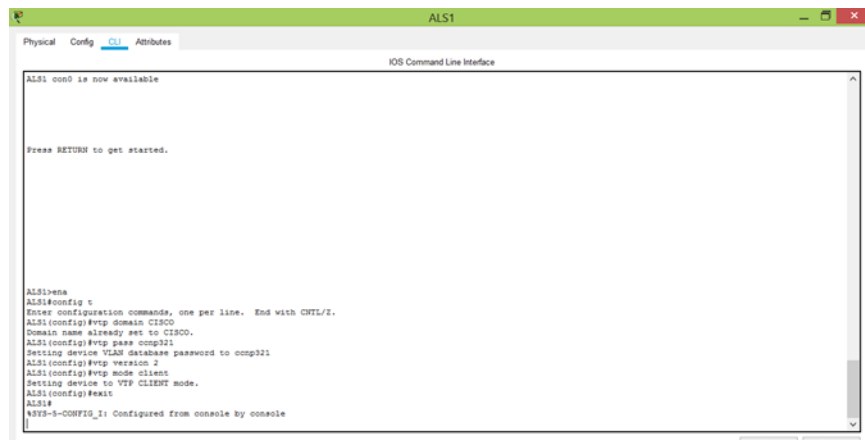
Figura 32. Configuración DLS1 servidor principal.



## ALS1

```
ALS1>ena
ALS1#config t
ALS1(config)#vtp domain CISCO
Domain name already set to CISCO
ALS1(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
ALS1(config)#vtp version 2
ALS1(config)#vtp mode client
ALS1(config)#exit
```

Figura 33. Configuración ALS1 servidor principal.



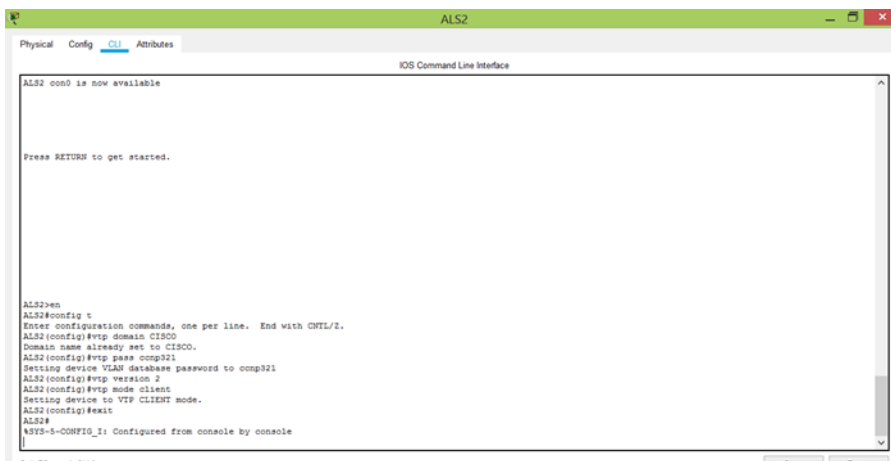
```
ALS1 com0 is now available

Press RETURN to get started.

ALS1>ena
ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#vtp domain CISCO
Domain name already set to CISCO.
ALS1(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
ALS1(config)#vtp version 2
ALS1(config)#vtp mode client
Setting device to VTP CLIENT mode.
ALS1(config)#exit
ALS1#
NVS-5-CONFIG_1: Configured from console by console
```

```
ALS2
ALS2>en
ALS2#config t
ALS2(config)#vtp domain CISCO
Domain name already set to CISCO.
ALS2(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
ALS2(config)#vtp version 2
ALS2(config)#vtp mode client
ALS2(config)#exit
ALS2#
```

Figura 34. Configuración ALS2 servidor principal.



```
ALS2 com0 is now available

Press RETURN to get started.

ALS2>en
ALS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#vtp domain CISCO
Domain name already set to CISCO.
ALS2(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
ALS2(config)#vtp version 2
ALS2(config)#vtp mode client
Setting device to VTP CLIENT mode.
ALS2(config)#exit
ALS2#
NVS-5-CONFIG_1: Configured from console by console
```

e. Configurar en el servidor principal las siguientes VLAN:

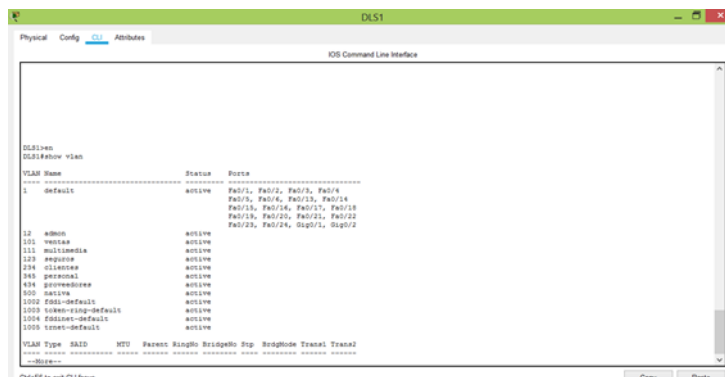
Tabla 1. Relación VLAN

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

```

DLS1>en
DLS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#vlan 500
DLS1(config-vlan)#name nativa
DLS1(config-vlan)#vlan 12
DLS1(config-vlan)#name admon
DLS1(config-vlan)#vlan 234
DLS1(config-vlan)#name clientes
DLS1(config-vlan)#vlan 111
DLS1(config-vlan)#name multimedia
DLS1(config-vlan)#vlan 434
DLS1(config-vlan)#name proveedores
DLS1(config-vlan)#vlan 123
DLS1(config-vlan)#name seguros
DLS1(config-vlan)#vlan 101
DLS1(config-vlan)#name ventas
DLS1(config-vlan)#vlan 345
DLS1(config-vlan)#name personal
DLS1(config-vlan)#exit
DLS1(config)#exit
    
```

Figura 35. Configuración servidor principal VLAN.



f. En DLS1, suspender la VLAN 434.

El comando state suspend no esta soportado , no se puede suspender la Vlan

DLS1

DLS1>en

DLS1#config t

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

DLS1(config)#vlan 434

DLS1(config-vlan)#state suspend

^

% Invalid input detected at '^' marker.

DLS1(config-vlan)#exit

DLS1(config)#exit

DLS1#

%SYS-5-CONFIG\_I: Configured from console by console

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)#vlan 500

DLS2(config-vlan)#name nativa

DLS2(config-vlan)#vlan 12

DLS2(config-vlan)#name admon

DLS2(config-vlan)#vlan 234

DLS2(config-vlan)#name clientes

DLS2(config-vlan)#vlan 111

DLS2(config-vlan)#name multimedia

DLS2(config-vlan)#vlan 434

DLS2(config-vlan)#name proveedores

DLS2(config-vlan)#vlan 123

DLS2(config-vlan)#name seguros

DLS2(config-vlan)#vlan 101

DLS2(config-vlan)#name ventas

DLS2(config-vlan)#vlan 345

DLS2(config-vlan)#name personal

DLS2(config-vlan)#exit

DLS2#

DLS2>en

```
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
DLS2(config)#vtp version 2
DLS2(config)#exit
DLS2#
```

h. Suspend VLAN 434 en DLS2.

```
DLS2
DLS2>en
DLS2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#vlan 434
DLS2(config-vlan)#vlan state suspend
      ^
% Invalid input detected at '^' marker.
DLS2(config-vlan)#exit
DLS2(config)#exit
DLS2#
```

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>en
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#vlan 567
DLS2(config-vlan)#name contabilidad
DLS2(config-vlan)#exit
DLS2(config)#interface port-channel 2
DLS2(config-if)#switchport trunk allowed vlan except 567
DLS2(config-if)#interface port-channel 3
DLS2(config-if)#switchport trunk allowed vlan except 567
DLS2(config-if)#exit
DLS2(config)#exit
DLS2#
```

Figura 36. Configuración DLS2 VLAN 567.

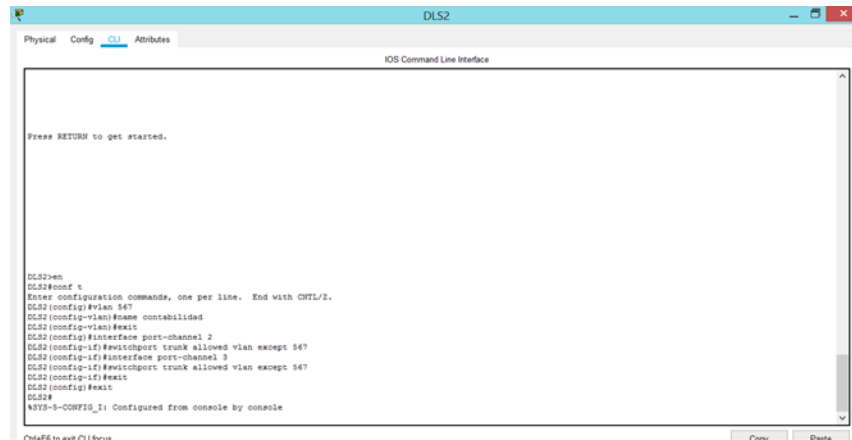
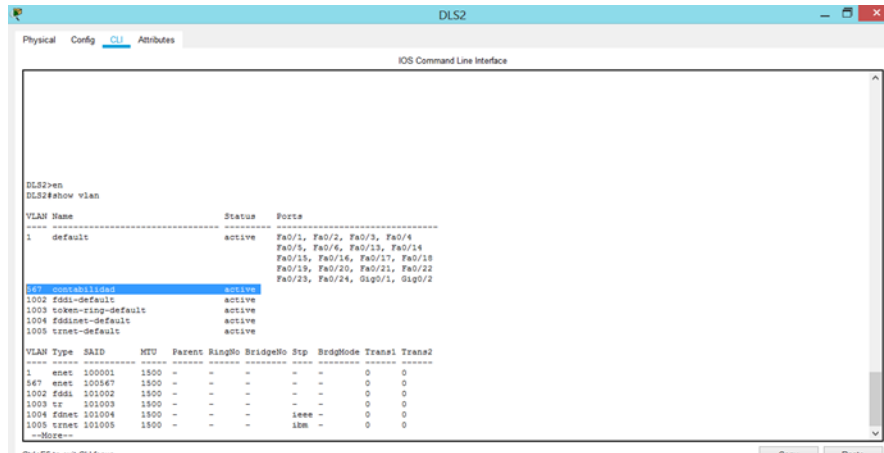


Figura 37. Ajuste configuración DLS2 VLAN 567.



- 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#conf t

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

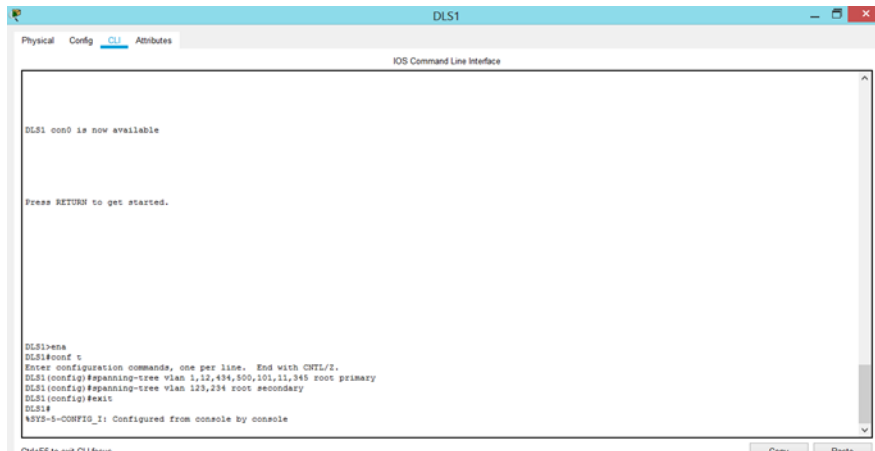
DLS1(config)#spanning-tree vlan 1,12,434,500,101,11,345 root primary

DLS1(config)#spanning-tree vlan 123,234 root secondary

DLS1(config)#exit

DLS1#

Figura 38. Configuración DLS1 como Spanning tree root.



```
DLS1
Physical Config CLI Attributes
IOS Command Line Interface

DLS1 con0 is now available

Press RETURN to get started.

DLS1>ena
DLS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#spanning-tree vlan 12,434,500,101,11,345 root primary
DLS1(config)#spanning-tree vlan 123,234 root secondary
DLS1(config)#exit
DLS1
%SYS-5-CONFIG_I: Configured from console by console
Ctrl-E to exit Ctrl-B to run Copy Paste
```

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#conf t

DLS2(config)#spanning-tree vlan 123,234 root primary

DLS2(config)#spanning-tree vlan 12,434,500,101,111,345 root secondary

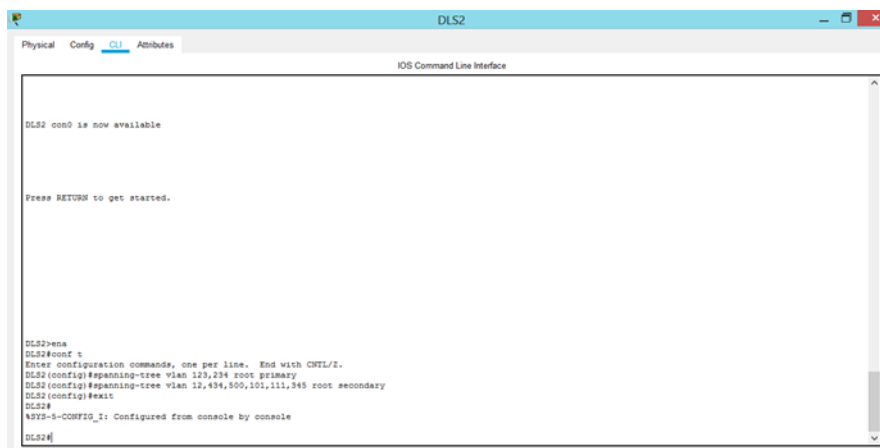
DLS2(config)#exit

DLS2#

%SYS-5-CONFIG\_I: Configured from console by console

Exit

Figura 39. Configuración DLS2 como Spanning tree root.



```
DLS2
Physical Config CLI Attributes
IOS Command Line Interface

DLS2 con0 is now available

Press RETURN to get started.

DLS2>ena
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#spanning-tree vlan 123,234 root primary
DLS2(config)#spanning-tree vlan 12,434,500,101,111,345 root secondary
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
DLS2#
```

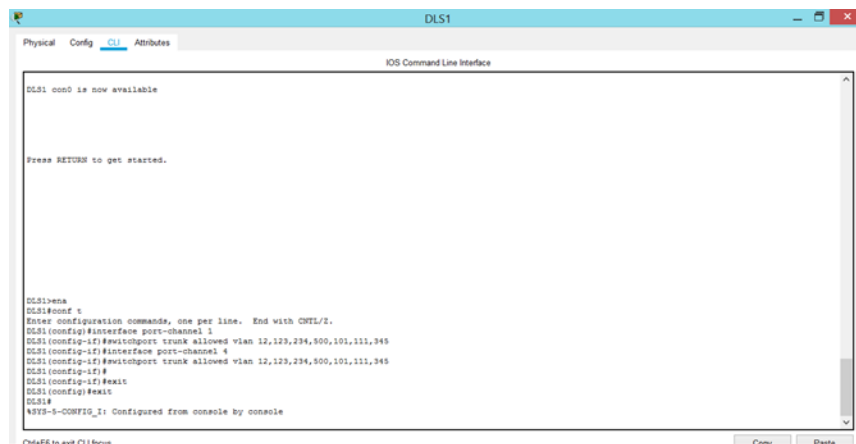
l. Configurar todos los puertos como troncales de tal forma que solamente las VLAN que se han creado se les permitirá circular a través de éstos puertos.

```

Rta/
DLS1>en
DLS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface port-channel 1
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,101,111,345
DLS1(config-if)#interface port-channel 4
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,101,111,345
DLS1(config-if)#exit
DLS1(config)#exit
DLS1#

```

Figura 40. Configuración de puertos como troncales.

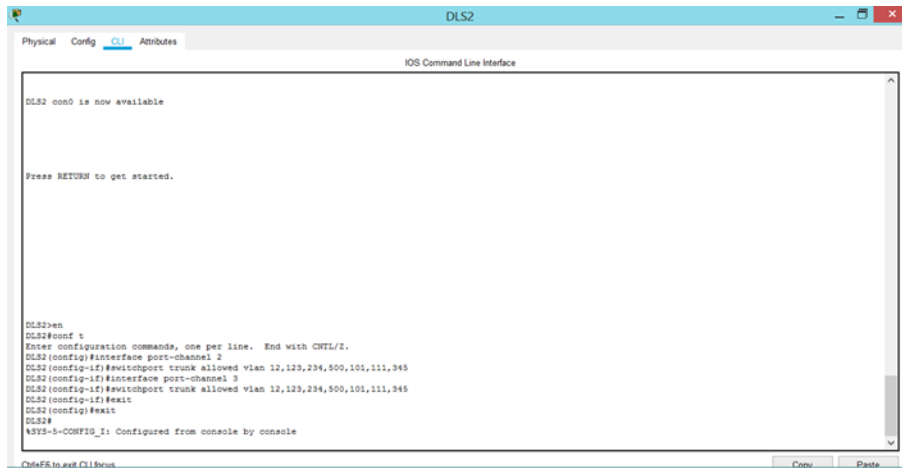


```

DLS2
DLS2>en
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface port-channel 2
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,101,111,345
DLS2(config-if)#interface port-channel 3
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,101,111,345
DLS2(config-if)#exit
DLS2(config)#exit
DLS2#

```

Figura 41. Ajuste configuración de puertos como troncales.



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

Tabla 2. Relación de interfaces

Interfaz	DLS1	DLS2	ALS1	ALS2
Interfaz Fa0/6	3456	12 , 1010	123, 1010	234
Interfaz Fa0/15	1111	1111	1111	1111
Interfaces F0 /16-18	567			

DLS1

DLS1>en

DLS1#conf t

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

DLS1(config)#interface fastethernet 0/6

DLS1(config-if)#switchport mode access

DLS1(config-if)#switchport access vlan 345

DLS1(config-if)#spanning-tree portfast

DLS1(config-if)#no shutdown

DLS1(config-if)#interface fastethernet 0/15

DLS1(config-if)#switchport mode access

DLS1(config-if)#switchport access vlan 111

DLS1(config-if)#spanning-tree portfast

DLS1(config-if)#no shutdown

```
DLS1(config-if)#exit
DLS1(config)#exit
DLS1#
```

Figura 42. Configuración DLS1 como puertos de acceso.

```
DLS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface fastEthernet 0/6
DLS1(config-if)#switchport mode access
DLS1(config-if)#switchport access vlan 345
DLS1(config-if)#spanning-tree portfast
Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

Portfast has been configured on FastEthernet0/6 but will only
have effect when the interface is in a non-trunking mode.
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)#interface fastEthernet 0/15
DLS1(config-if)#switchport mode access
DLS1(config-if)#switchport access vlan 111
DLS1(config-if)#spanning-tree portfast
Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

Portfast has been configured on FastEthernet0/15 but will only
have effect when the interface is in a non-trunking mode.
DLS1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to down
DLS1(config-if)#exit
DLS1(config)#exit
DLS1#
```

```
DLS2
DLS2>en
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#interface fastEthernet 0/6
DLS2(config-if)#switchport mode access
DLS2(config-if)#switchport access vlan 12
DLS2(config-if)#spanning-tree portfast
(config-if)#no shutdown
DLS2(config-if)#interface fastEthernet 0/15
DLS2(config-if)#switchport mode access
DLS2(config-if)#switchport access vlan 111
DLS2(config-if)#spanning-tree portfast
DLS2(config-if)#no shutdown
DLS2(config-if)#interface fastEthernet 0/16-18
DLS2(config-if)#switchport mode Access
DLS2(config-if)#switchport access vlan 567
DLS2(config-if)#spanning-tree portfast
DLS2(config-if)#no shutdown
DLS2(config-if)#exit
DLS2(config)#exit
DLS2#
```

Figura 43. Configuración DLS2 como puertos de acceso.

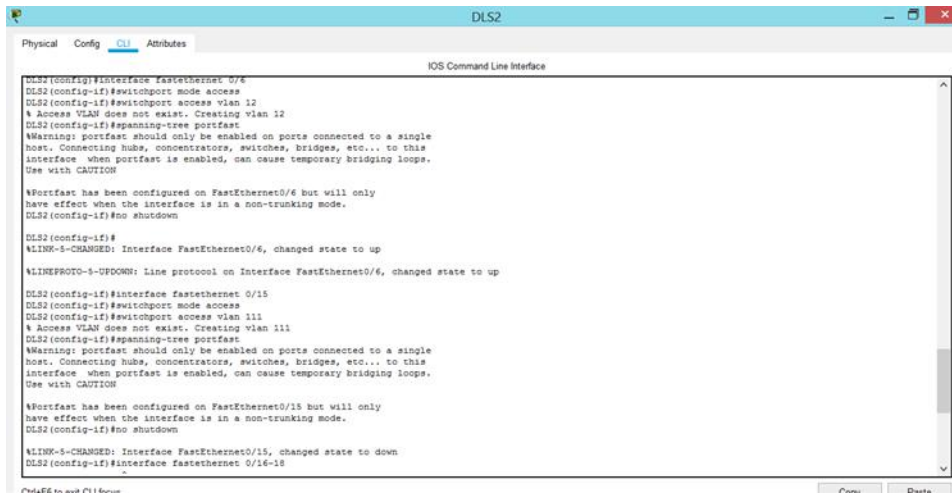
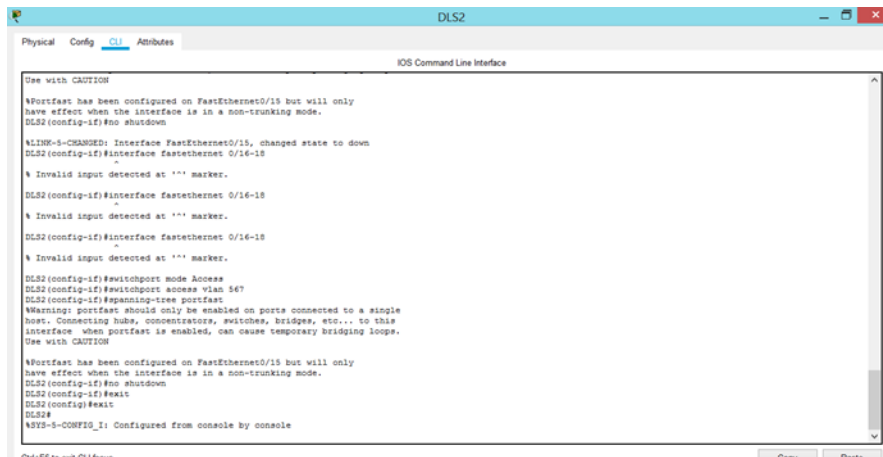


Figura 44. Ajuste configuración DLS2 como puertos de acceso.



ALS1

ALS1>en

ALS1#conf t

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

ALS1(config)#interface fastethernet 0/6

ALS1(config-if)#switchport mode access

ALS1(config-if)#switchport access vlan 123

ALS1(config-if)#spanning-tree portfast

ALS1(config-if)#no shutdown

ALS1(config-if)#interface fastethernet 0/15

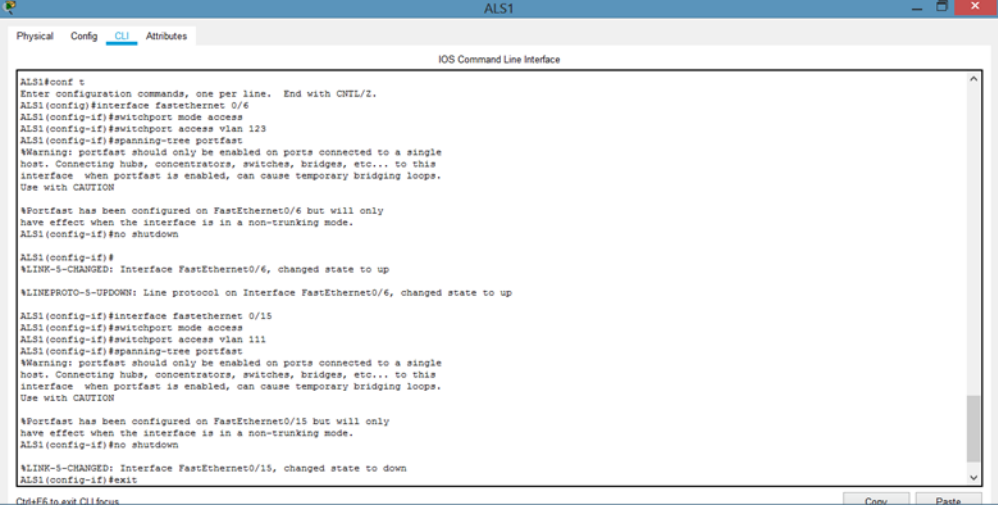
ALS1(config-if)#switchport mode access

ALS1(config-if)#switchport access vlan 111

ALS1(config-if)#spanning-tree portfast

```
ALS1(config-if)#no shutdown
ALS1(config-if)#exit
ALS1(config)#exit
ALS1#
```

Figura 45. Configuración ALS1 como puertos de acceso.



```
ALS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface fastethernet 0/6
ALS1(config-if)#switchport mode access
ALS1(config-if)#switchport access vlan 123
ALS1(config-if)#spanning-tree portfast
Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

Portfast has been configured on FastEthernet0/6 but will only
have effect when the interface is in a non-trunking mode.
ALS1(config-if)#no shutdown

ALS1(config-if)#
%LINK-3-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

ALS1(config-if)#interface fastethernet 0/15
ALS1(config-if)#switchport mode access
ALS1(config-if)#switchport access vlan 111
ALS1(config-if)#spanning-tree portfast
Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

Portfast has been configured on FastEthernet0/15 but will only
have effect when the interface is in a non-trunking mode.
ALS1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to down
ALS1(config-if)#exit
ALS1#
```

```
ALS2
ALS2>en
ALS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface fastethernet 0/6
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 234
ALS2(config-if)#spanning-tree portfast
ALS2(config-if)#no shutdown
ALS2(config-if)#interface fastethernet 0/15
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 111
ALS2(config-if)#spanning-tree portfast
ALS2(config-if)#no shutdown
ALS2(config-if)#exit
ALS2(config)#exit
ALS2#
```

Figura 46. Configuración ALS2 como puertos de acceso.

```

ALS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface FastEthernet 0/6
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 234
ALS2(config-if)#spanning-tree portfast
!Warning: portfast should only be enabled on ports connected to a single
!host. Connecting hubs, concentrators, switches, bridges, etc... to this
!interface when portfast is enabled, can cause temporary bridging loops.
!Use with CAUTION

!Portfast has been configured on FastEthernet0/6 but will only
!have effect when the interface is in a non-trunking mode.
ALS2(config-if)#no shutdown

ALS2(config-if)#
%LINE-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)#interface FastEthernet 0/15
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 111
ALS2(config-if)#spanning-tree portfast
!Warning: portfast should only be enabled on ports connected to a single
!host. Connecting hubs, concentrators, switches, bridges, etc... to this
!interface when portfast is enabled, can cause temporary bridging loops.
!Use with CAUTION

!Portfast has been configured on FastEthernet0/15 but will only
!have effect when the interface is in a non-trunking mode.
ALS2(config-if)#no shutdown

%LINE-5-CHANGED: Interface FastEthernet0/15, changed state to down
ALS2(config-if)#exit
  
```

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

se utiliza el comando **show vlan** para verificar la existencia de las vlan

Figura 47. Configuración DLS1 VLAN en switches.

```

DLS1#show vlan
-----
VLAN Name                Status    Ports
-----
1    default                 active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                           Fa0/5, Fa0/13, Fa0/14, Fa0/16
                                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                           Gig0/1, Gig0/2

12   admn                    active
101  ventas                  active
111  Multimedia              active    Fa0/15
123  repurpose                 active
234  cliente                 active
345  personal                active    Fa0/6
434  provedores              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  BrgdMode Trans1 Trans2
-----
1    enet  100001  1500  -    -    -    -    -    0    0
12   enet  100012  1500  -    -    -    -    -    0    0
101  enet  100101  1500  -    -    -    -    -    0    0
111  enet  100111  1500  -    -    -    -    -    0    0
123  enet  100123  1500  -    -    -    -    -    0    0
234  enet  100234  1500  -    -    -    -    -    0    0
345  enet  100345  1500  -    -    -    -    -    0    0
434  enet  100434  1500  -    -    -    -    -    0    0
500  enet  100500  1500  -    -    -    -    -    0    0
1002 fddi  101002  1500  -    -    -    -    -    0    0
--More--
  
```

Figura 48. Configuración DLS2 VLAN en switches.

The screenshot shows the CLI of a switch named DLS2. The command 'DLS2#show vlan' has been executed, displaying the following information:

```

DLS2#show vlan
VLAN Name                Status    Ports
-----
1  default                 active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                   Fa0/5, Fa0/13, Fa0/14, Fa0/16
                                   Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                   Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                   Giga0/1, Giga0/2
12  VLAN0012               active    Fa0/6
111  VLAN0111               active
567  contabilidad           active    Fa0/15
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
12  enet  100012  1500  -    -    -    -    -    -    0    0
111  enet  100111  1500  -    -    -    -    -    -    0    0
567  enet  100567  1500  -    -    -    -    -    -    0    0
1002  fddi  101002  1500  -    -    -    -    -    -    0    0
1003  tr    101003  1500  -    -    -    -    -    -    0    0
1004  fdnet 101004  1500  -    -    -    -    ieee  -    0    0
1005  trnet 101005  1500  -    -    -    -    ibm   -    0    0

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

Remote SPAN VLANs
-----
--More--
  
```

Figura 49. Configuración ALS1 VLAN en switches.

The screenshot shows the CLI of a switch named ALS1. The command 'ALS1#show vlan' has been executed, displaying the following information:

```

ALS1#show vlan
VLAN Name                Status    Ports
-----
1  default                 active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                   Fa0/5, Fa0/11, Fa0/12, Fa0/13
                                   Fa0/14, Fa0/16, Fa0/17, Fa0/18
                                   Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                   Fa0/23, Fa0/24, Giga0/1, Giga0/2
12  admn                   active
101  ventas                 active
111  multimedia             active    Fa0/15
123  seguros                active    Fa0/6
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
12  enet  100012  1500  -    -    -    -    -    -    0    0
101  enet  100101  1500  -    -    -    -    -    -    0    0
111  enet  100111  1500  -    -    -    -    -    -    0    0
123  enet  100123  1500  -    -    -    -    -    -    0    0
234  enet  100234  1500  -    -    -    -    -    -    0    0
345  enet  100345  1500  -    -    -    -    -    -    0    0
434  enet  100434  1500  -    -    -    -    -    -    0    0
500  enet  100500  1500  -    -    -    -    -    -    0    0
1002  fddi  101002  1500  -    -    -    -    -    -    0    0

--More--
  
```

Figura 50. Configuración ALS2 VLAN en switches.

```

ALS2#show vlan
-----
VLAN Name                Status Ports
-----
1    default                 active Fa0/1, Fa0/2, Fa0/3, Fa0/4
                               Fa0/5, Fa0/11, Fa0/12, Fa0/13
                               Fa0/14, 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 Fa0/15
123  seguros                  active
234  clientes                 active Fa0/6
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    BrgdMode Trans1 Trans2
-----
1    enet  100001  1500  -     -     -     -     -     0     0
12   enet  100012  1500  -     -     -     -     -     0     0
101  enet  100101  1500  -     -     -     -     -     0     0
111  enet  100111  1500  -     -     -     -     -     0     0
123  enet  100123  1500  -     -     -     -     -     0     0
234  enet  100234  1500  -     -     -     -     -     0     0
345  enet  100345  1500  -     -     -     -     -     0     0
434  enet  100434  1500  -     -     -     -     -     0     0
500  enet  100500  1500  -     -     -     -     -     0     0
1002 fddi  101002  1500  -     -     -     -     -     0     0
--More--
  
```

b. Verificar que el EtherChannel entre DLS1 y ALS1 está configurado correctamente

verificar con el comando **show etherchannel**

Figura 51. Configuración DLS1 EtherChannel entre DLS1 y ALS1 .

```

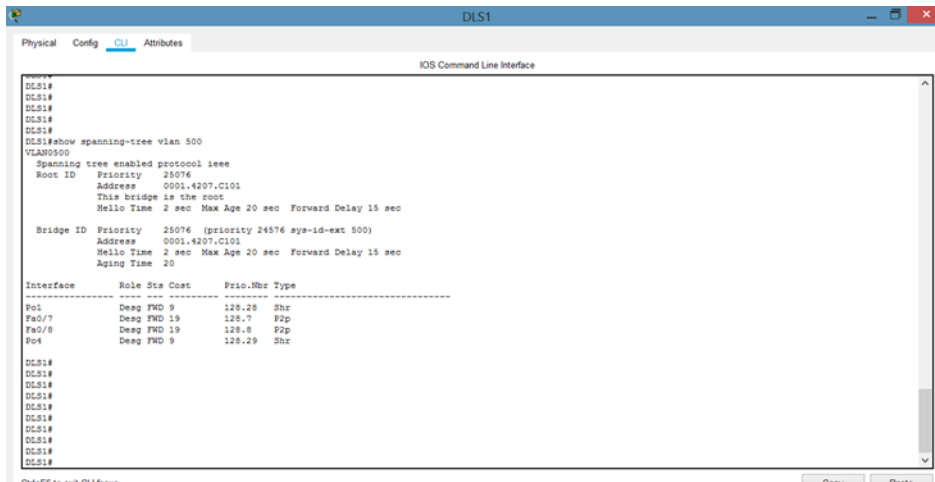
DLS1#show etherchannel
      Channel-group listing:
-----
Group: 1
-----
Group state = L2
Ports: 2 Maxports = 16
Port-channels: 1 Max Port-channels = 16
Protocol:  LACP

Group: 4
-----
Group state = L2
Ports: 2 Maxports = 8
Port-channels: 1 Max Portchannels = 1
Protocol:  PAGP

Group: 12
-----
Group state = L3
Ports: 0 Maxports = 8
Port-channels: 1 Max Portchannels = 1
Protocol:  PAGP
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
  
```



Figura 54. Configuración DLS1 Spanning tree entre DLS1 o DLS2 VLAN.



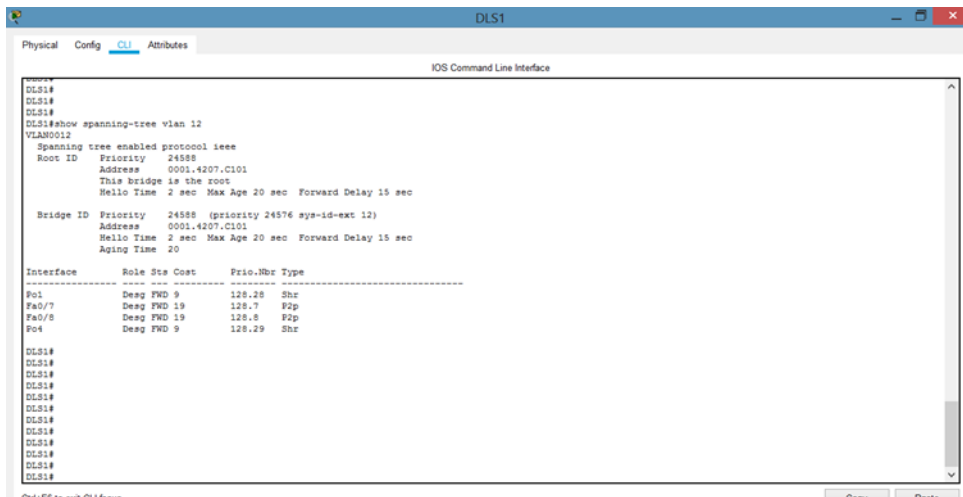
```
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#show spanning-tree vlan 500
VLAN0050
Spanning tree enabled protocol ieee
Root ID Priority 25076
Address 0001.4207.C101
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 25076 (priority 24576 sys-id-ext 500)
Address 0001.4207.C101
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa0/7 Desg FWD 19 128.7 P2p
Fa0/8 Desg FWD 19 128.8 P2p
Fa0/4 Desg FWD 9 128.29 Shr

DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
```

Figura 55. Ajuste configuración DLS1 Spanning tree entre DLS1 o DLS2 VLAN.



```
DLS1#
DLS1#
DLS1#
DLS1#show spanning-tree vlan 12
VLAN0012
Spanning tree enabled protocol ieee
Root ID Priority 24588
Address 0001.4207.C101
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24588 (priority 24576 sys-id-ext 12)
Address 0001.4207.C101
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Fa0/7 Desg FWD 9 128.28 Shr
Fa0/7 Desg FWD 19 128.7 P2p
Fa0/8 Desg FWD 19 128.8 P2p
Fa0/4 Desg FWD 9 128.29 Shr

DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
```

Figura 56. DLS1 Spanning tree entre DLS1 o DLS2 VLAN.

```

DLS1#
DLS1#
DLS1#
DLS1#
DLS1#show spanning-tree vian 234
VLAN0234
Spanning tree enabled protocol ieee
Root ID    Priority    28906
           Address    0001.4207.C101
           This bridge is the root
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    28906 (priority 28672 sys-id-ext 234)
           Address    0001.4207.C101
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Po1       Desg FWD 9    128.28 Shr
Fa0/7     Desg FWD 19   128.7  P2p
Fa0/8     Desg FWD 19   128.8  P2p
Po4       Desg FWD 9    128.29 Shr

DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#

```

Figura 57. Ajustes DLS1 Spanning tree entre DLS1 o DLS2 VLAN.

```

DLS1#
DLS1#
DLS1#
DLS1#show spanning-tree vian 111
VLAN0111
Spanning tree enabled protocol ieee
Root ID    Priority    28783
           Address    00D0.BADA.5C2D
           Cost      18
           Port      28 (Port-channel)
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    32879 (priority 32768 sys-id-ext 111)
           Address    0001.4207.C101
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----
Po1       Root FWD 9    128.28 Shr
Fa0/7     Desg FWD 19   128.7  P2p
Fa0/8     Desg FWD 19   128.8  P2p
Po4       Altn BLK 9    128.29 Shr

DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#
DLS1#

```

## CONCLUSIONES

El desarrollo de los escenarios permite la aplicación de enunciados con direcciones loopback para verificar el funcionamiento y programación con los parámetros establecidos para los ejercicios planteados.

Si es necesario redistribuir rutas en un sistema autónomo, se debe tener en cuenta que el protocolo EIGRP utiliza cinco métricas.

Con el desarrollo del escenario No.1 se logra implementar el direccionamiento ip y las tablas de enrutamiento, a través del uso de los protocolos EIGRP y OSPF para establecer rutas para la movilización de datos mediante la conexión entre diferentes dispositivos y tipos de red de acuerdo a los requerimientos del usuario.

En el escenario No. 1, no se requiere el uso de enrutamientos estáticos, dado que con el uso de los protocolos de enrutamiento configurados, se logró convergencia en la red hizo permitiendo con ello la conectividad de extremo a extremo.

En el escenario No. 2 para la transmisión de datos se logró realizar enrutamientos, direccionamiento ip y creación de VLAN.

Para el escenario No. 2, fue posible validar a través de diferentes comandos que las configuraciones realizadas en los switches y del spanning tree están correctas y cumplen con el requerimiento del usuario.

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