

DIPLOMADO DE PROFUNDIZACION CISCO
PRUEBA DE HABILIDADES PRÁCTICAS CCNP

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

NOTA DE ACEPTACIÓN

Firma del presidente del Jurado

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Firma del Jurado

Bogotá, 19 de octubre de 2020

AGRADECIMIENTOS

Quiero agradecer a mis padres y a mi hermano y familia por llegar hasta este punto de mi vida y poder decir que he finalizado otro capítulo de mi etapa de estudio, y verme graduada como ingeniera de telecomunicaciones ya que fue un largo camino hasta aquí.

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GLOSARIO

CISCO: es una empresa global con sede en San José, California, Estados Unidos, principalmente dedicada a la fabricación, venta, mantenimiento y consultoría de equipos de telecomunicaciones.

CCNP: La certificación Cisco Certified Network Professional (CCNP) enrutamiento y conmutación valida la capacidad de planificar, implementar, verificar y solucionar problemas de redes empresariales locales y de área amplia y trabajar en colaboración con especialistas en seguridad avanzada, voz, soluciones inalámbricas y de video.

REDES: Como en todo proceso de comunicación, se requiere de un emisor, un mensaje, un medio y un receptor. La finalidad principal para la creación de una red de ordenadores es compartir los recursos y la información en la distancia, asegurar la confiabilidad y la disponibilidad de la información, aumentar la velocidad de transmisión de los datos y reducir el costo. Un ejemplo es Internet, el cual es una gran red de millones de ordenadores ubicados en distintos puntos del planeta interconectados básicamente para compartir información y recursos

ROUTER: Es un dispositivo que permite interconectar computadoras que funcionan en el marco de una red. Su función: se encarga de establecer la ruta que destinará a cada paquete de datos dentro de una red informática.

SWITCH: Un switch o conmutador es un dispositivo de interconexión utilizado para conectar equipos en red formando lo que se conoce como una red de área local (LAN) y cuyas especificaciones técnicas siguen el estándar conocido como Ethernet (o técnicamente IEEE 802.3).

RESUMEN

En el siguiente trabajo se abarcan temas tan importantes como la configuración de las redes y los métodos que más se utilizan para crear, modificar, y realizar enlaces con el uso de diferentes canales en base a la tecnología usada por Cisco junto con sus equipos de red. Teniendo en cuenta lo anterior y en la fase final del curso en CCNP y para probar las habilidades adquiridas es necesario que se desarrollen las dos simulaciones propuestas, con diferentes aspectos para lograr un networking exitoso soportado en la configuración de Vlans, administración y enrutamiento, utilización de protocolos y algo que es muy importante con la introducción de las direcciones IPV6 y cómo utilizarlas en los diferentes escenarios.

Veremos cómo paso a paso se va dando solución a el ejercicio planteado utilizando el software Packet tracer en Routers y switch.

Para conseguir que se cumpla con el objetivo de esta actividad es necesario cumplir con los estándares de calidad establecidos por la Universidad y los conocimientos obtenidos en el transcurso del curso.

Palabras Clave: CISCO, CCNP, REDES, ROUTER, SWITCH, IPV6, NETWORKING.

ABSTRACT

The following work covers topics as important as the configuration of the networks and the methods that are most used to create, modify, and make links with the use of different channels based on the technology used by Cisco together with its network equipment . Taking into account the above and in the final phase of the course in CCNP and to test the acquired skills it is necessary to develop the two simulations proposed, with different aspects to achieve a successful networking supported in the configuration of Vlans, administration and routing, use of protocols and something that is very important with the introduction of IPV6 addresses and how to use them in different scenarios.

We will see how step by step solution is being given to the exercise proposed using the Packet tracer software on routers and switches.

In order to achieve the objective of this activity, it is necessary to comply with the quality standards established by the University and the knowledge obtained during the course.

Keywords: CISCO, CCNP, REDES, ROUTER, SWITCH, IPV6, NETWORKING.

INTRODUCCIÓN

El presente trabajo de la asignatura CCNP correspondiente a la actividad final Prueba de Habilidades, se puso en práctica todas las unidades manejadas en el transcurso de la materia. Las redes de la actualidad tienen un impacto significativo en nuestras vidas, ya que cambian nuestra forma de vivir, trabajar y divertirnos. Las redes de computadoras permiten a las personas comunicarse, colaborar e interactuar de maneras totalmente. Utilizamos la red de distintas formas, entre ellas las aplicaciones web, la telefonía IP, video conferencia, los juegos interactivos, el comercio electrónico, la educación y más.

En este trabajo se desarrollan los conceptos y temáticas descritos durante el curso para ser puestos en práctica durante el diplomado de profundización cisco, para ello tenemos tres propuestas representadas en escenarios, donde se aplica el direccionamiento, protocolos de enrutamiento OSPF, EIGRP 10, interfaces, vlans, se configuran relaciones de vecinos BGP, VTP y DTP; actividades desarrolladas en packet tracer.

Se realizará verificación de conectividad mediante pruebas con el uso de los comandos ping, traceroute, show ip router, show run para verificar la configuración completa y detallada de los switch y router cisco implementado en los escenarios. Con el fin de validar el procedimiento.

DESARROLLO

1. ESCENARIO 1

Figura 1. Escenario 1

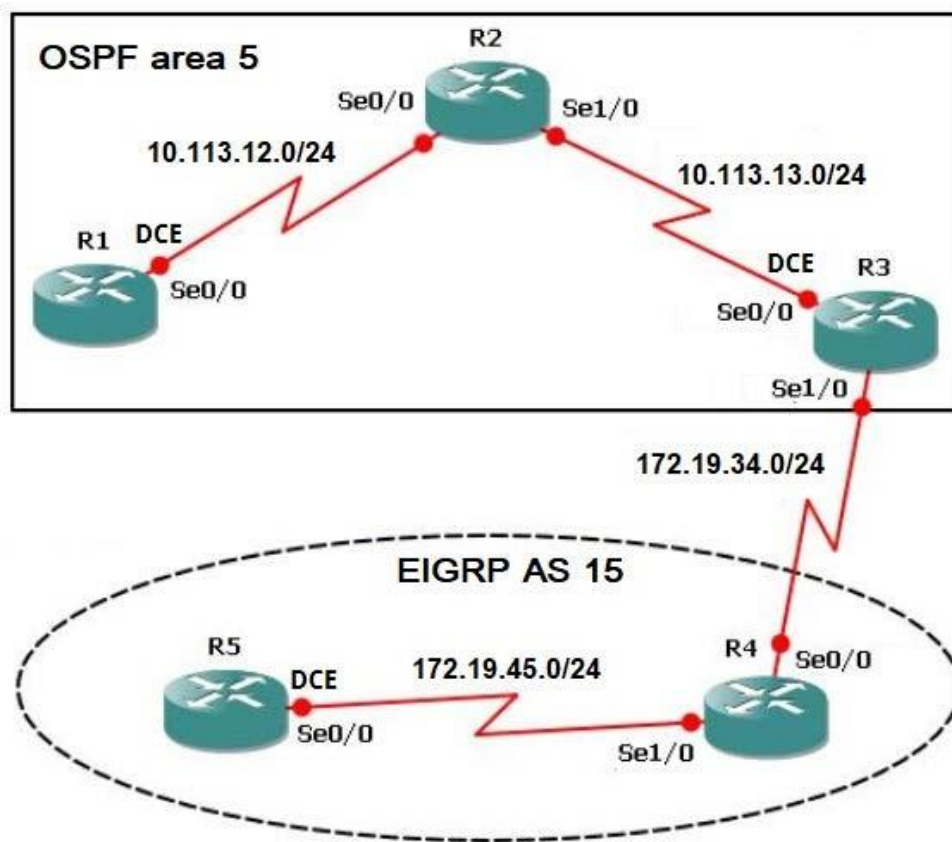
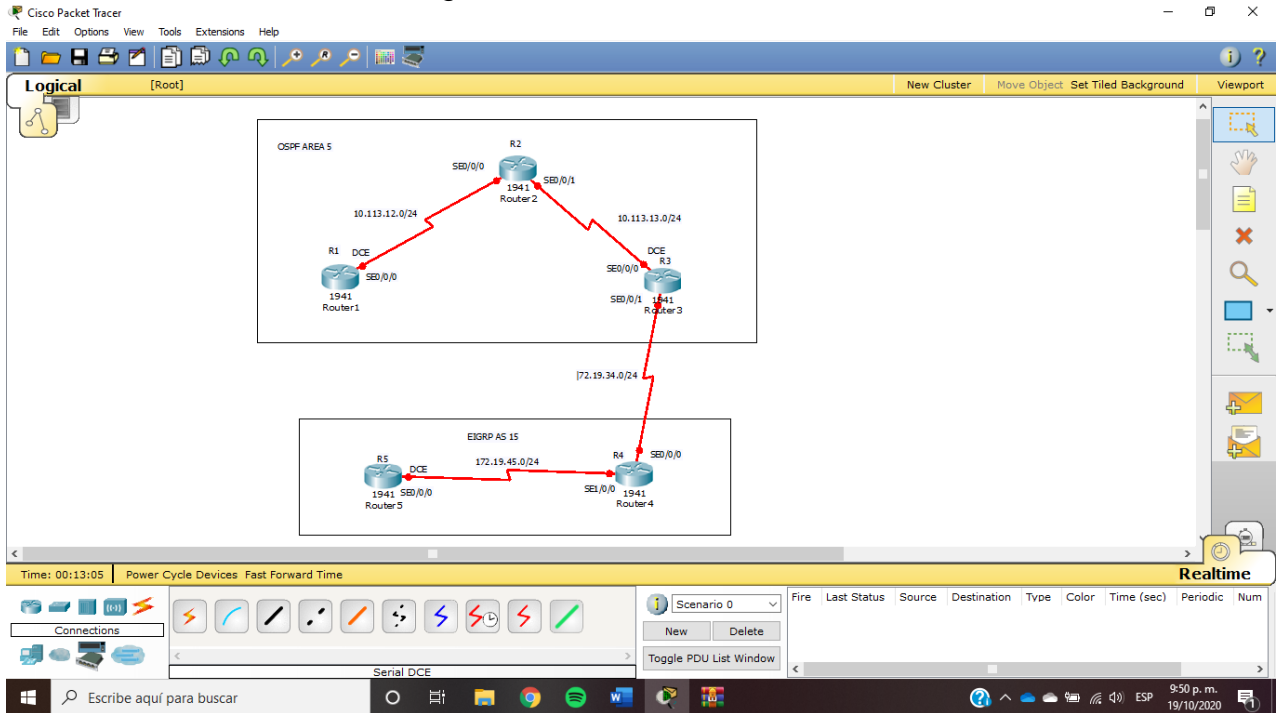


Figura 2. Simulación de escenario 1



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.

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

Se adjunta código y pantallazos con veracidad del código.

Tabla 1. Interfaces loopback para crear R1

Router 1	interface Loopback 11
IP	ip address 10.1.0.0 255.255.255.252
IP	ip address 10.1.1.1 255.255.255.252
IP	ip address 10.103.12.1 255.255.255.248

Router R1

```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#interface lo0 11
      ^
% Invalid input detected at '^' marker.

R1(config)#interface Lo0 11
      ^
% Invalid input detected at '^' marker.

R1(config)#interface Loopback 11

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback11, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback11, changed state to up

R1(config-if)#ip address 10.1.0.0 255.255.255.252
Bad mask /30 for address 10.1.0.0
R1(config-if)#ip address 10.1.1.1 255.255.255.252
R1(config-if)#exit
R1(config)#interface serial0/0/0
R1(config-if)#descriptio R1
R1(config-if)#clock rate 64000
R1(config-if)#bandwidth 64
      ^
% Invalid input detected at '^' marker.

R1(config-if)#bandwidth 64
R1(config-if)#ip address 10.103.12.1 255.255.255.248
R1(config-if)#no shutdown

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

```

Figura 3. Aplicando código R1

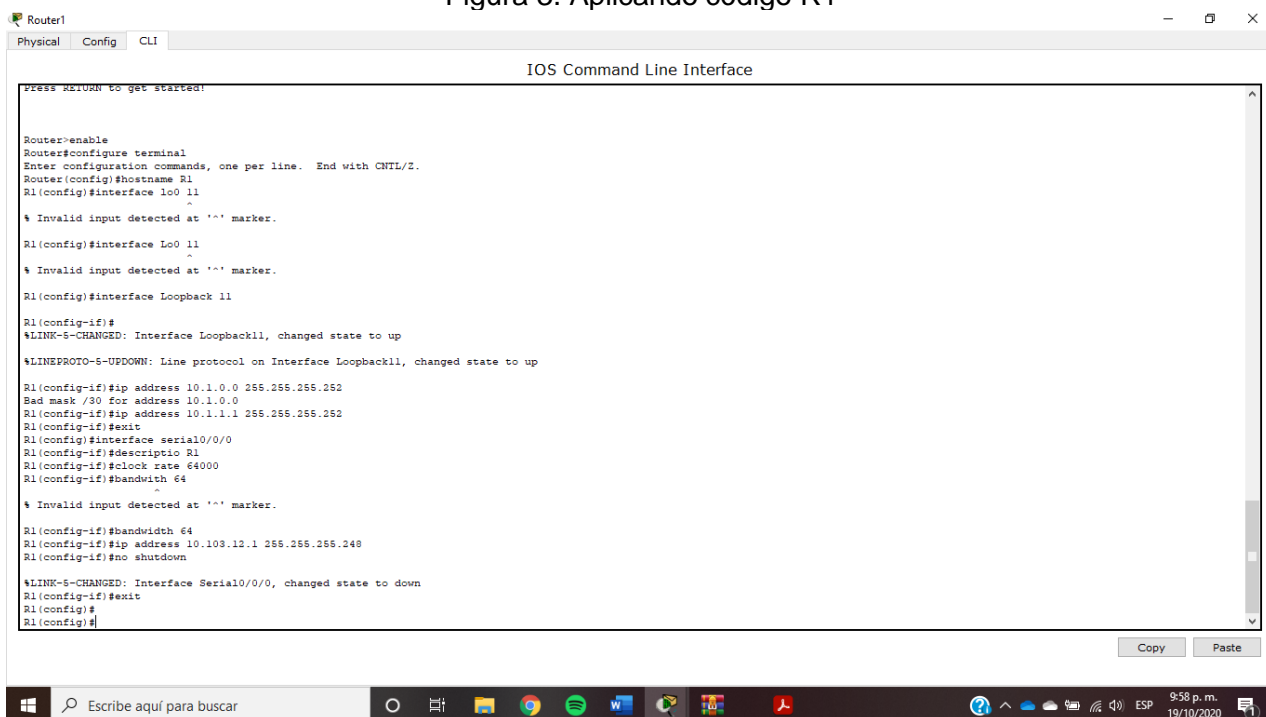


Tabla 2. Interfaces loopback para crear R2

Router 2	interface Loopback 23
IP	ip address 10.1.2.1 255.255.255.252
IP	ip address 10.103.12.2 255.255.255.248
IP	ip address 10.103.23.2 255.255.255.248

Router R2

R2#enable

R2#configure terminal

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

R2(config)#hostname R2

R2(config)#interface Loopback 23

R2(config-if)#

%LINK-5-CHANGED: Interface Loopback23, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback23, changed state to up

R2(config-if)#ip address 10.1.2.1 255.255.255.252

R2(config-if)#exit

R2(config)#interface serial0/0/0

R2(config-if)#description R2->R1

R2(config-if)#bandwidth 64

```
R2(config-if)#ip address 10.103.12.2 255.255.255.248
R2(config-if)#no shutdown
```

```
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

```
R2(config-if)#exit
R2(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
```

```
R2(config)#interface serial0/0/1
R2(config-if)#description R2->R3
R2(config-if)#clock rate 64000
R2(config-if)#bandwidth 64
R2(config-if)#ip address 10.103.23.2 255.255.255.248
R2(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#exit
```

Figura 4. Aplicando código R2

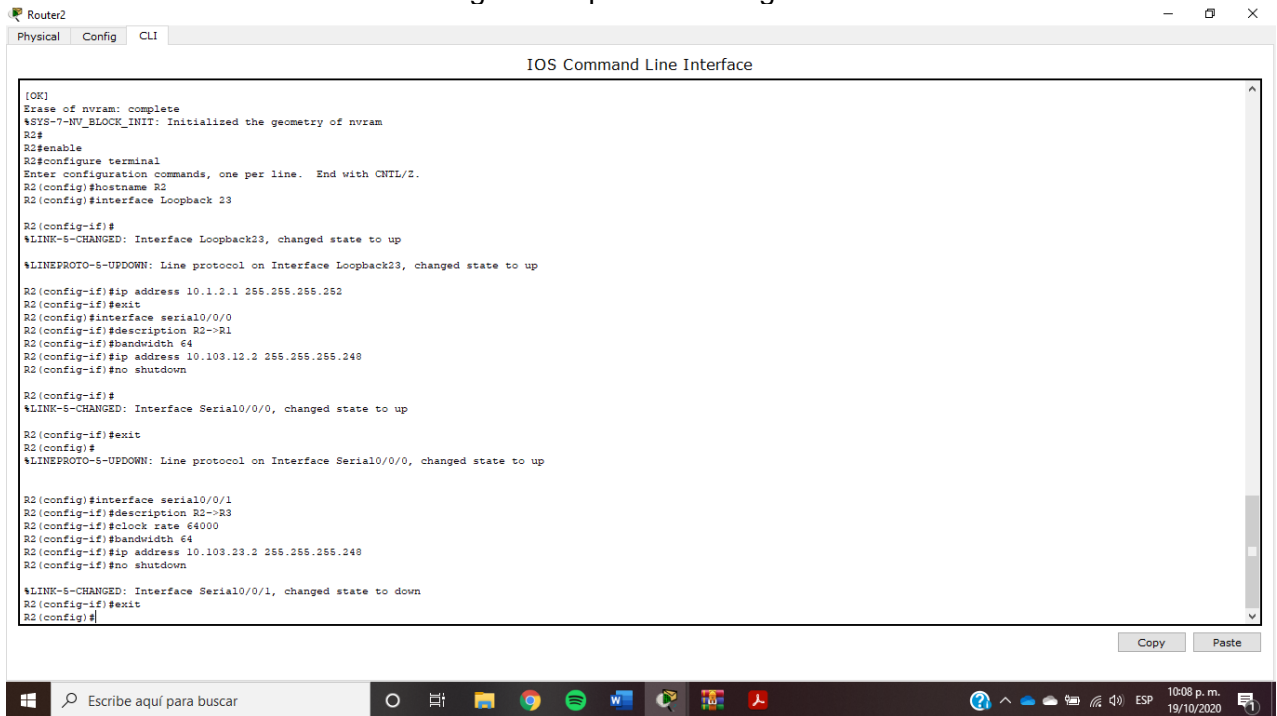


Tabla 3. Loopback para crear R3

Router 3	interface Loopback 33
IP	ip address 10.1.3.1 255.255.255.252
IP	ip address 10.103.23.3 255.255.255.248

IP	ip address 10.103.23.3 255.255.255.248
----	--

Router R3

```
R3>enable
```

```
R3#configure terminal
```

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

```
R3(config)#hostname R3
```

```
R3(config)#interface Loopback 33
```

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

```
%LINK-5-CHANGED: Interface Loopback33, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback33, changed state to up
```

```
R3(config-if)#ip address 10.1.3.1 255.255.255.252
```

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

```
R3(config)#interface serial0/0/0
```

```
R3(config-if)#description R3->R2
```

```
R3(config-if)#clock rate 64000
```

```
This command applies only to DCE interfaces
```

```
R3(config-if)#bandwidth 64
```

```
R3(config-if)#ip address 10.103.23.3 255.255.255.248
```

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

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

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

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

```
R3(config)#no shutdown
```

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

```
R3(config)#interface serial0/0/1
```

```
R3(config-if)#description R3->R4
```

```
R3(config-if)#bandwidth 64
```

```
R3(config-if)#ip address 172.29.34.4 255.255.255.248
```

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

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

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

Figura 5. Aplicando código R3

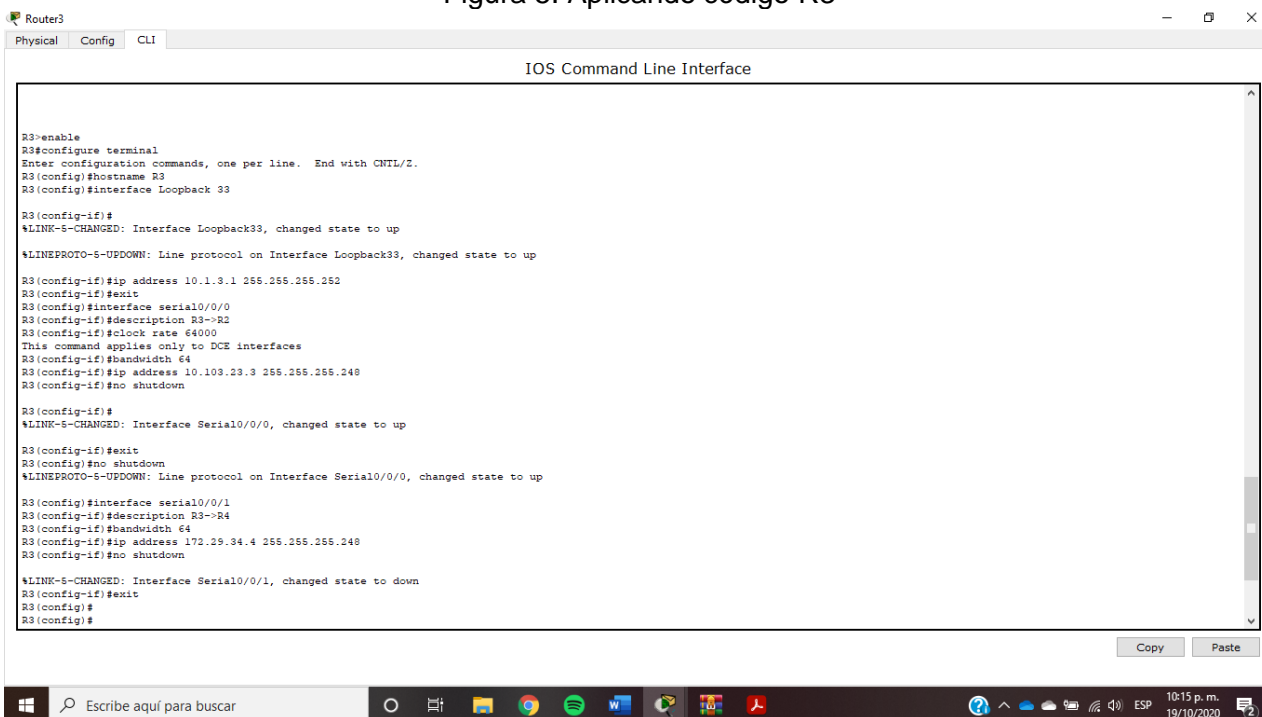


Tabla 4. Loopback para crear R4

Router 4	interface Loopback 43
IP	ip address 10.1.4.1 255.255.255.252
IP	ip address 172.29.34.4 255.255.255.248
IP	ip address 172.29.45.5 255.255.255.248

Router R4

Router>enable

Router#configure terminal

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

Router(config)#hostname R4

R4(config)#interface Loopback 43

R4(config-if)#

%LINK-5-CHANGED: Interface Loopback43, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback43, changed state to up

R4(config-if)#ip address 10.1.4.1 .255.255.255.252

^

% Invalid input detected at '^' marker.

```
R4(config-if)#ip address 10.1.4.1 255.255.255.252
```

```
R4(config-if)#exit
```

```
R4(config)#interface serial0/0/0
```

```
R4(config-if)#description R4->R3
```

```
R4(config-if)#clockrate 64000
```

```
^
```

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

```
R4(config-if)#clock rate 64
```

```
^
```

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

```
R4(config-if)#clock rate 64000
```

```
This command applies only to DCE interfaces
```

```
R4(config-if)#bandwidth 64
```

```
R4(config-if)#ip address 172.29.34.4 255.255.255.248
```

```
R4(config-if)#no shutdown
```

```
R4(config-if)#
```

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

```
R4(config-if)#exit
```

```
R4(config)#interface serial0/0/0
```

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

```
R4(config)#interface serial0/0/1
```

```
R4(config-if)#description R4->R3
```

```
R4(config-if)#bandwidth 64
```

```
R4(config-if)#ip address 172.29.45.5 255.255.255.248
```

```
R4(config-if)#no shutdown
```

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

```
R4(config-if)#exit
```

```
R4(config)#router eigrp 10
```

```
R4(config-router)#network 10.0.0.0
```

```
R4(config-router)#exit
```

```
R4(config)#exit
```

```
R4#
```

Figura 6. Aplicando código R4

```
Router4
Physical Config CLI
IOS Command Line Interface

Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R4
R4(config)#interface Loopback 43
R4(config-if)#
%LINK-5-CHANGED: Interface Loopback43, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback43, changed state to up
R4(config-if)#ip address 10.1.4.1 255.255.255.252
* Invalid input detected at ... marker.
R4(config-if)#ip address 10.1.4.1 255.255.255.252
R4(config-if)#exit
R4(config)#interface serial0/0/0
R4(config-if)#description R4->R3
R4(config-if)#clockrate 64000
* Invalid input detected at ... marker.
R4(config-if)#clock rate 64
* Invalid input detected at ... marker.
R4(config-if)#clock rate 64000
This command applies only to DCE interfaces
R4(config-if)#bandwidth 64
R4(config-if)#ip address 172.29.34.4 255.255.255.248
R4(config-if)#no shutdown
R4(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R4(config-if)#exit
R4(config)#interface serial0/0/0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R4(config)#interface serial0/0/1
R4(config-if)#description R4->R3
```

Router R5

Router>enable

Router#configure terminal

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

Router(config)#hostname R5

R5(config)#interface Loopback 53

R5(config-if)#

%LINK-5-CHANGED: Interface Loopback53, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback53, changed state to up

R5(config-if)#ip address 10.1.5.1 255.255.255.252

R5(config-if)#exit

R5(config)#interface Serial0/0/0

R5(config-if)#description R5->R4

R5(config-if)#clock rate 64000

This command applies only to DCE interfaces

R5(config-if)#bandwidth 64

R5(config-if)#ip address 172.29.45.5 255.255.255.248

R5(config-if)#no shutdown

R5(config-if)#

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

R5(config-if)#exit

R5(config)#router e

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

R5(config)#router eigrp 10

```
R5(config-router)#network 10.0.0.0
R5(config-router)#exit
```

Figura 7. Aplicando código R5

```
Router5
Physical Config CLI
IOS Command Line Interface
Continue with configuration dialog? [yes/no]: n
Press RETURN to get started!
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R5
R5(config)#interface Loopback 53
R5(config-if)#
%LINK-5-CHANGED: Interface Loopback53, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback53, changed state to up
R5(config-if)#ip address 10.1.5.1 255.255.255.252
R5(config-if)#exit
R5(config)#interface Serial0/0/0
R5(config-if)#description R5->R4
R5(config-if)#clock rate 64000
This command applies only to DCE interfaces
R5(config-if)#bandwidth 64
R5(config-if)#ip address 172.29.45.5 255.255.255.248
R5(config-if)#no shutdown
R5(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R5(config-if)#exit
R5(config)#router e
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R5(config)#router eigrp 10
R5(config-router)#network 10.0.0.0
R5(config-router)#exit
R5(config)#
R5(config)#interface Serial0/0/1
R5(config-if)#
```

- 1.2. 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#configure t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface Loopback 20
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback20, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback20, changed state to up
```

```
R1(config-if)#ip address 10.1.1.3 255.255.255.252
Bad mask /30 for address 10.1.1.3
R1(config-if)#
R1(config-if)#ip address 10.1.1.4 255.255.255.252
Bad mask /30 for address 10.1.1.4
R1(config-if)#ip address 10.1.1.5 255.255.255.252
R1(config-if)#exit
R1(config)#interface Loopback 30
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback30, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback30, changed state to up
```

```
R1(config-if)#ip address 10.1.1.9 255.255.255.252
R1(config-if)#exit
R1(config)#interface Loopback 40
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback40, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback40, changed state to up
```

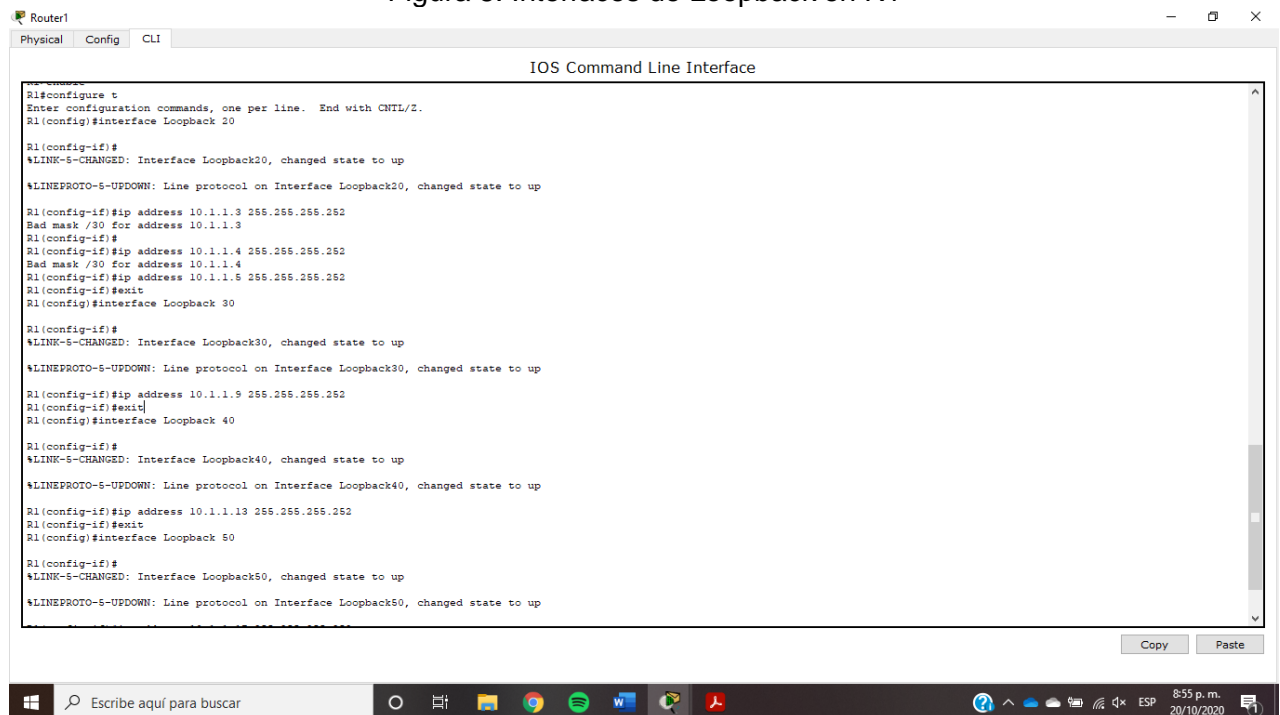
```
R1(config-if)#ip address 10.1.1.13 255.255.255.252
R1(config-if)#exit
R1(config)#interface Loopback 50
```

```
R1(config-if)#
%LINK-5-CHANGED: Interface Loopback50, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback50, changed state to up
```

```
R1(config-if)#ip address 10.1.1.17 255.255.255.252
R1(config-if)#exit
```

Figura 8. Interfaces de Loopback en R1



- 1.3. 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>enable
R5#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R5(config)#interface loopback 50

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback50, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback50, changed state to up

R5(config-if)#ip address 15.1.5.5 255.255.255.252
R5(config-if)#exit
R5(config)#interface loopback 60

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback60, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback60, changed state to up

R5(config-if)#ip address 15.1.5.9 255.255.255.252
R5(config-if)#exit
R5(config)#interface loopback 70

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback70, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback70, changed state to up

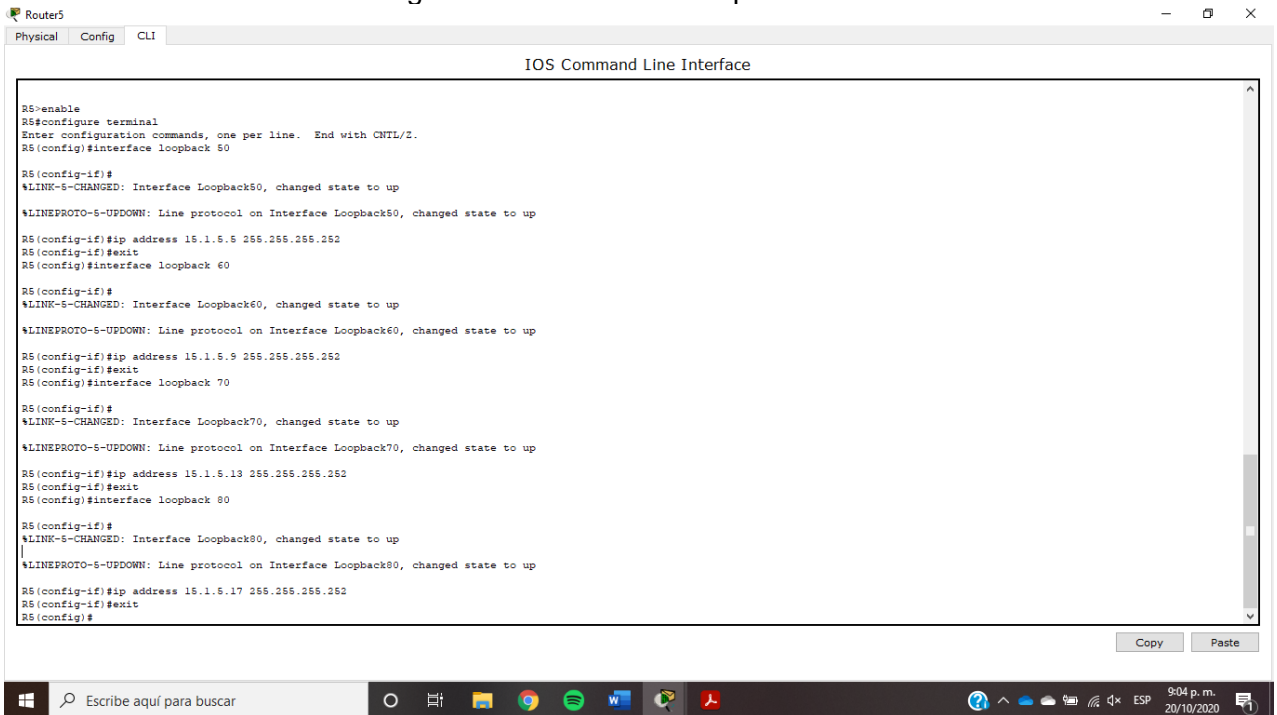
R5(config-if)#ip address 15.1.5.13 255.255.255.252
R5(config-if)#exit
R5(config)#interface loopback 80

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback80, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback80, changed state to up

R5(config-if)#ip address 15.1.5.17 255.255.255.252
R5(config-if)#exit
R5(config)#
```

Figura 9. Interfaces de Loopback en R5

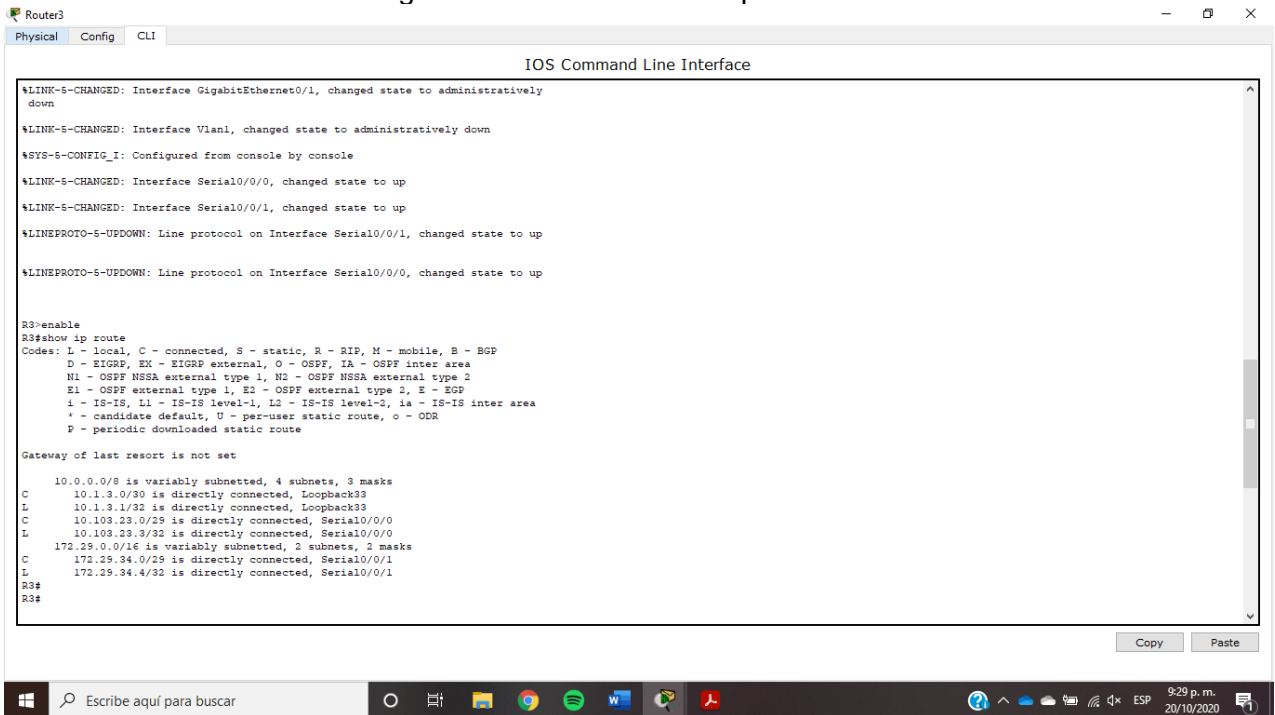


1.4. Analice la tabla de enrutamiento de R3 y verifique que R3 está aprendiendo las nuevas interfaces de Loopback mediante el comando show ip route.

Tabla 5. Configuración direcciones IP

ROUTER	INTERFAZ	IP
R3	Loopback 31	LO11: 10.1.3.1/30
R3	Loopback 35	LO15: 10.1.3.5/30
R3	Loopback 39	LO19: 10.1.3.9/30
R3	Loopback 13	LO19: 10.1.3.13/30
R3	Loopback 17	LO19: 10.1.3.17/30

Figura 10. Interfaces de Loopback en R1



- 1.5. 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 terminal
```

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

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

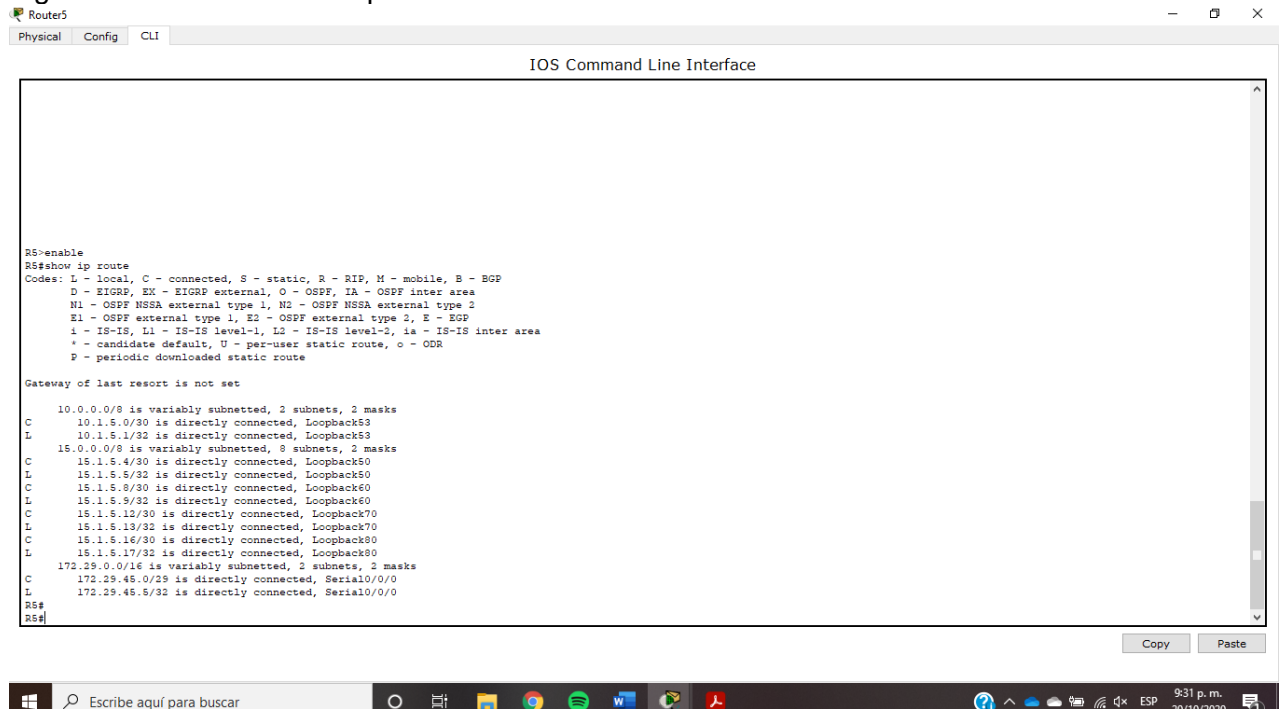
```
R3(config-router)#redistribute ospf 1 metric 10000 100 255 1 1500
^
```

% Invalid input detected at '^' marker.

```
R3(config-router)#redistribute ospf 1 metric 10000 100 255 1 1500
```

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


Figura 13. Comando show ip route



Segundo Escenario

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 14. Escenario 2

Topología de red

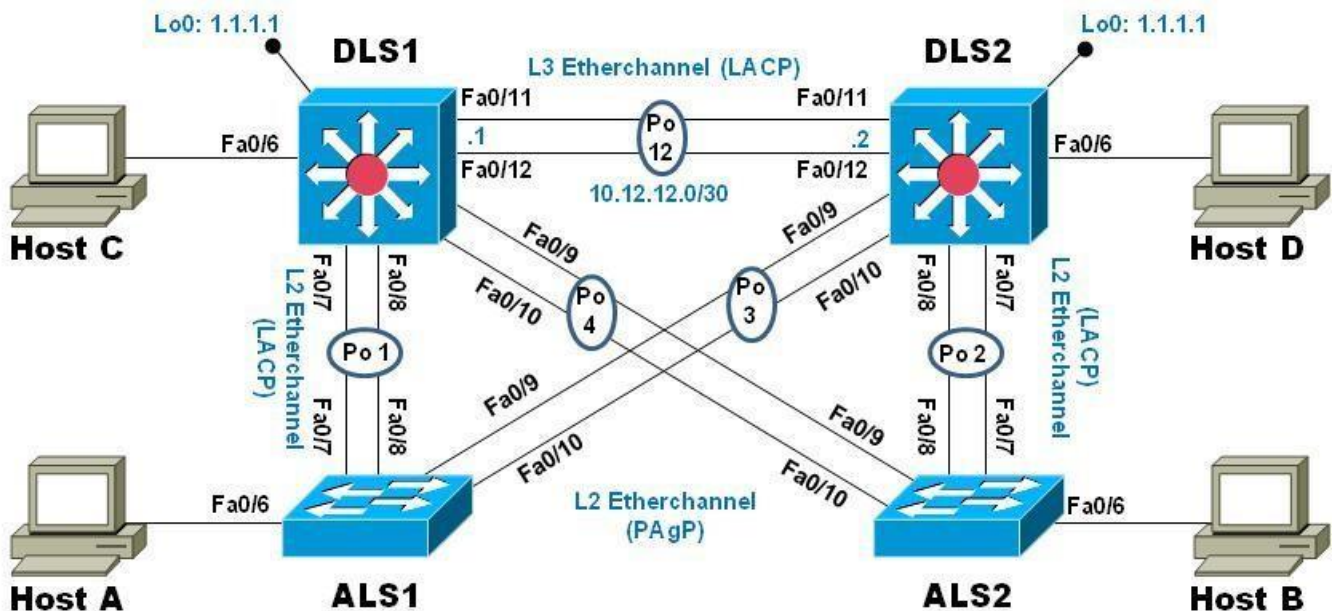
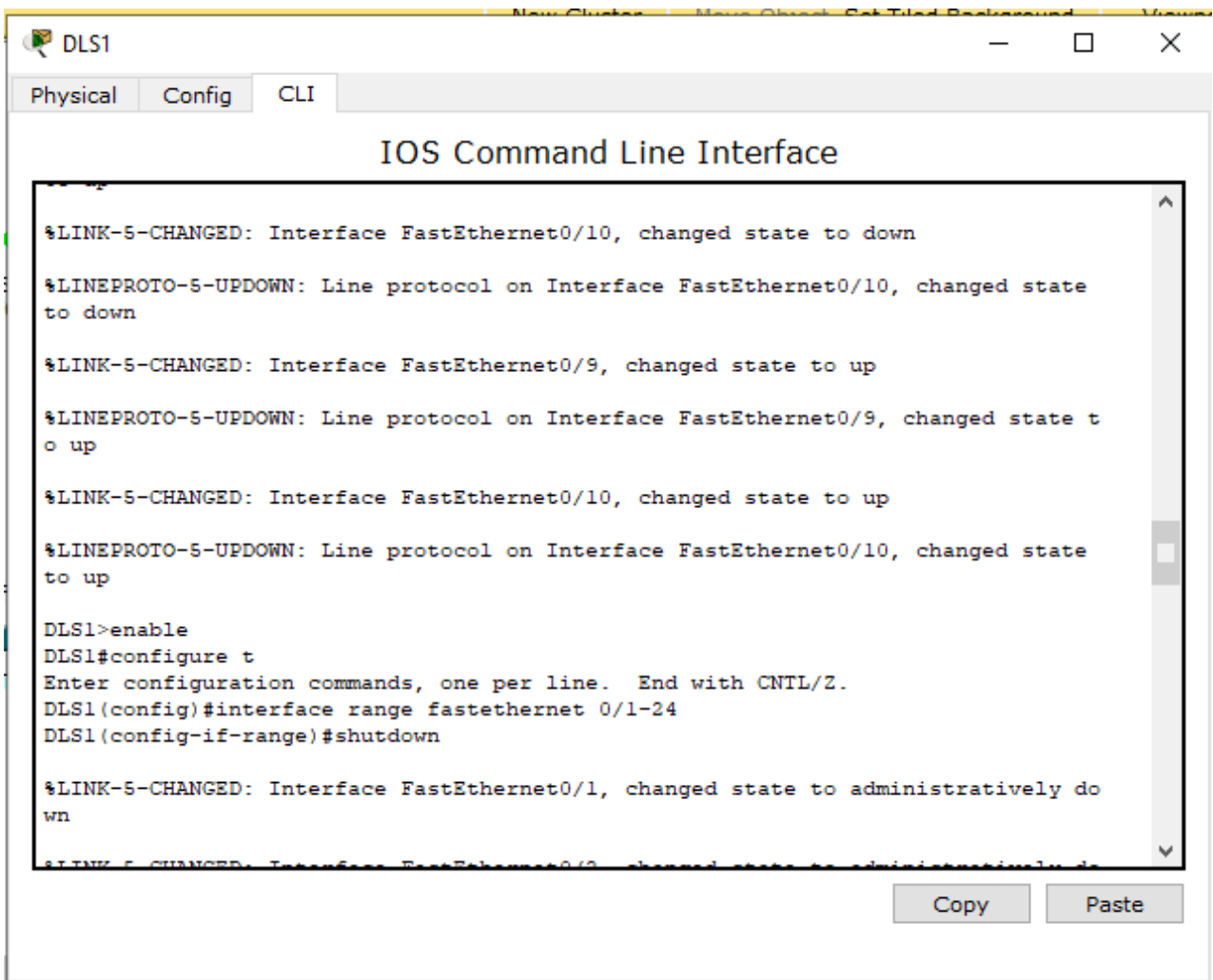
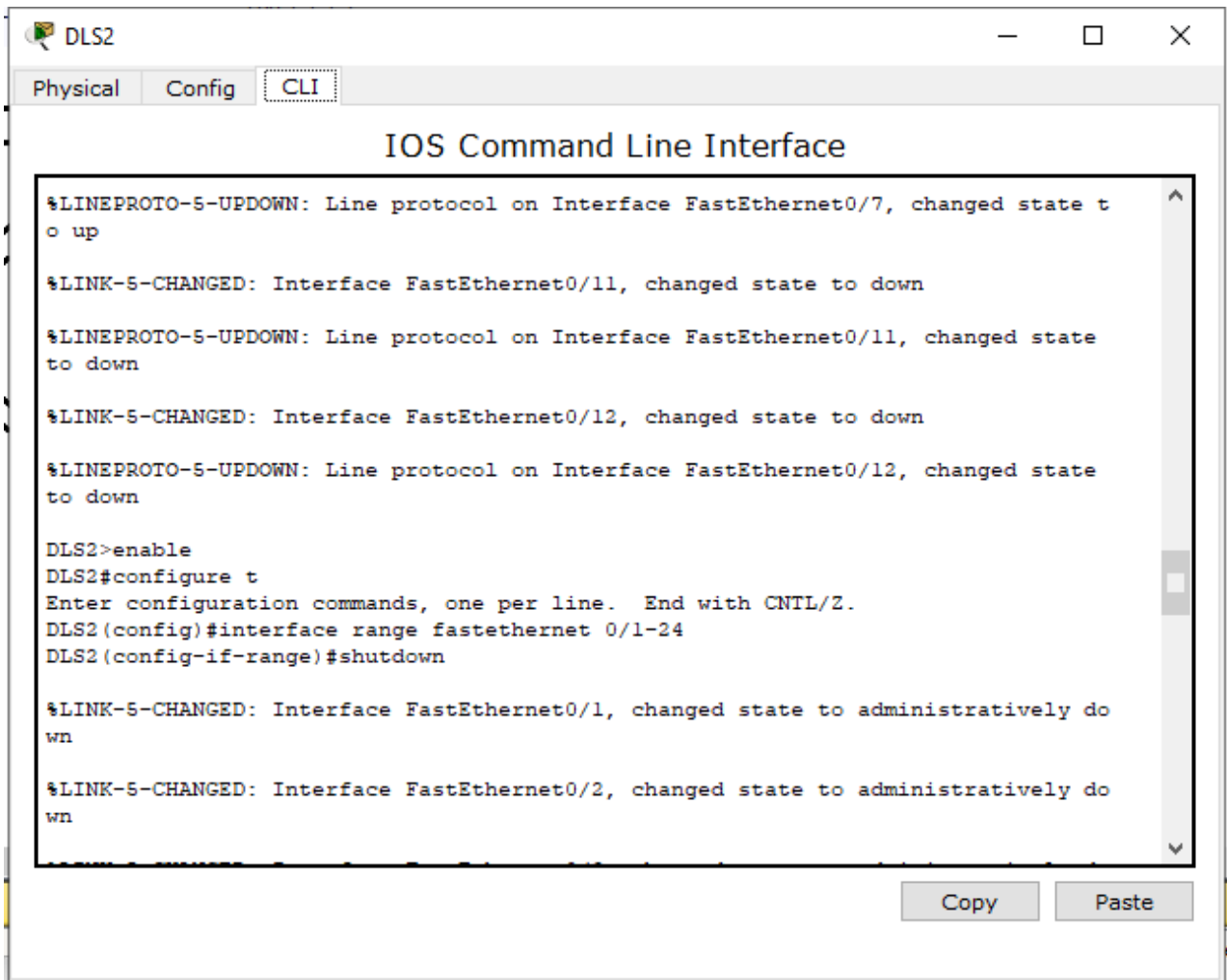


Figura 16. Se aplica código DLS1



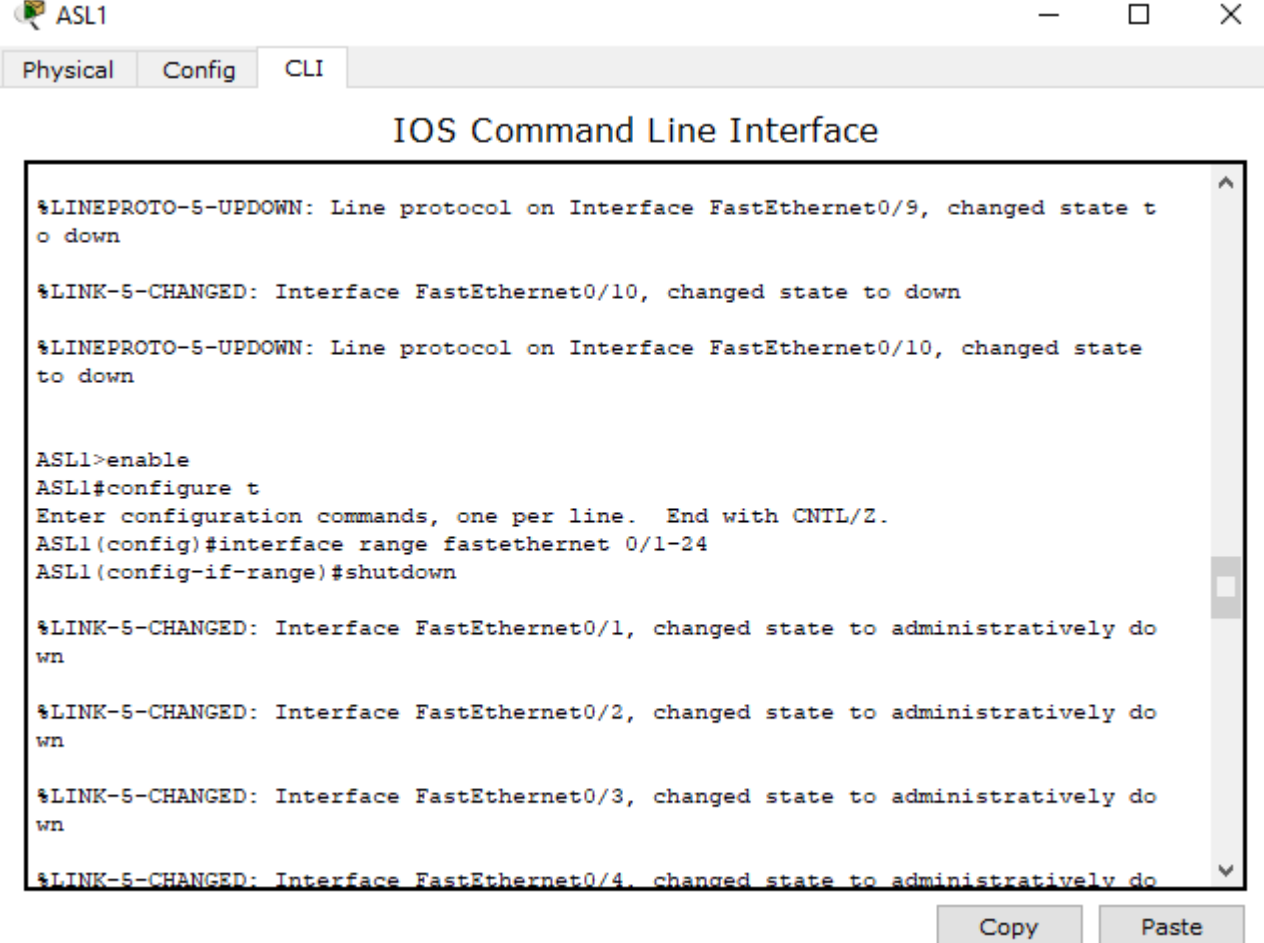
Se apaga las interfaces del switch DLS1.

Figura 17. Se aplica código DLS2



Se apaga las interfaces del switch DLS2

Figura 18. Se aplica código ASL1



The screenshot shows a terminal window titled "ASL1" with tabs for "Physical", "Config", and "CLI". The main content is the "IOS Command Line Interface" showing the following text:

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down

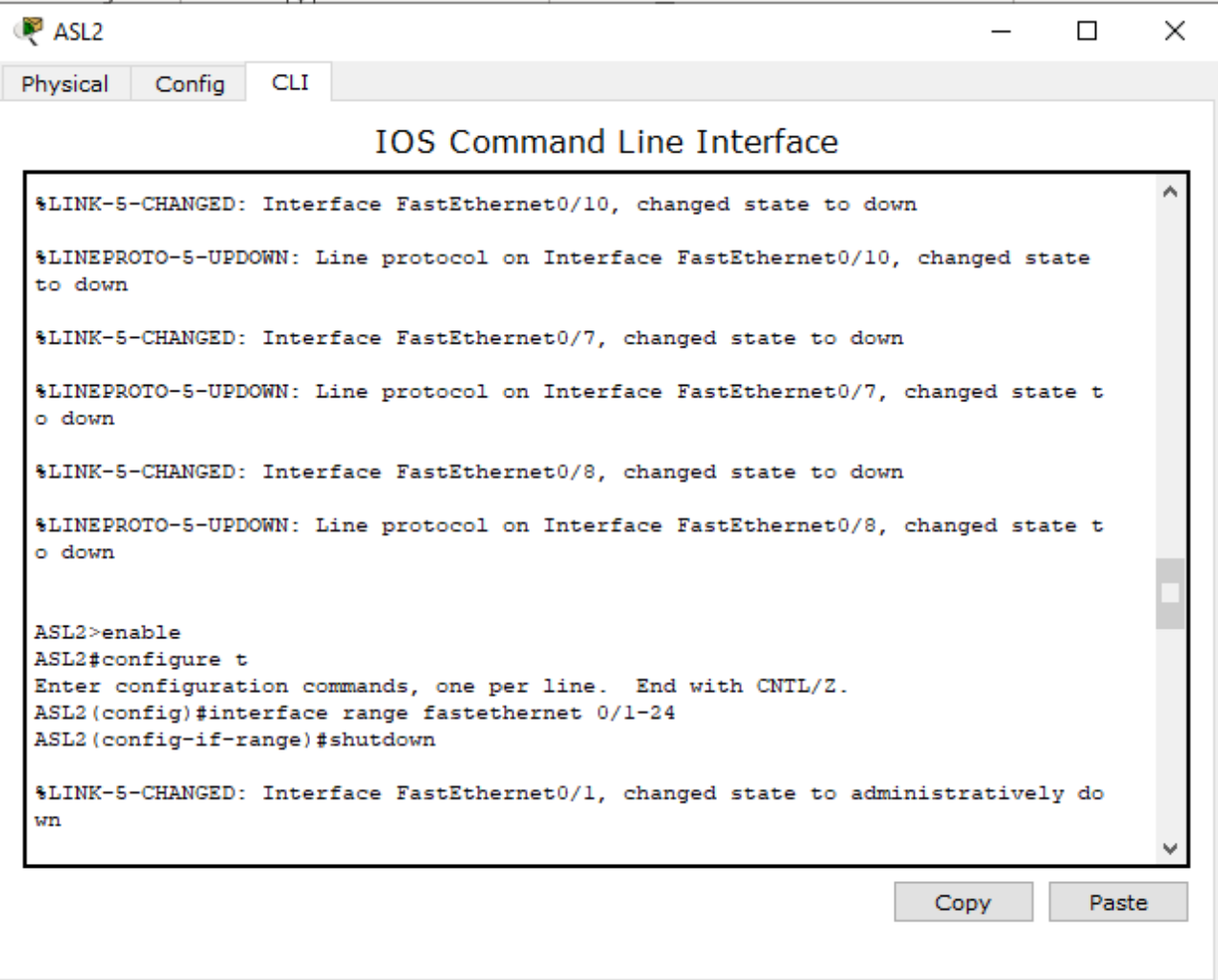
ASL1>enable
ASL1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ASL1(config)#interface range fastethernet 0/1-24
ASL1(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively down
```

At the bottom right of the terminal window, there are two buttons: "Copy" and "Paste".

Se apaga las interfaces del switch ASL1

Figura 19. Se aplica código ASL2



The screenshot shows a terminal window titled "ASL2" with tabs for "Physical", "Config", and "CLI". The main content is the "IOS Command Line Interface" where the following commands and system messages are displayed:

```
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/10, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down

ASL2>enable
ASL2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ASL2(config)#interface range fastethernet 0/1-24
ASL2(config-if-range)#shutdown

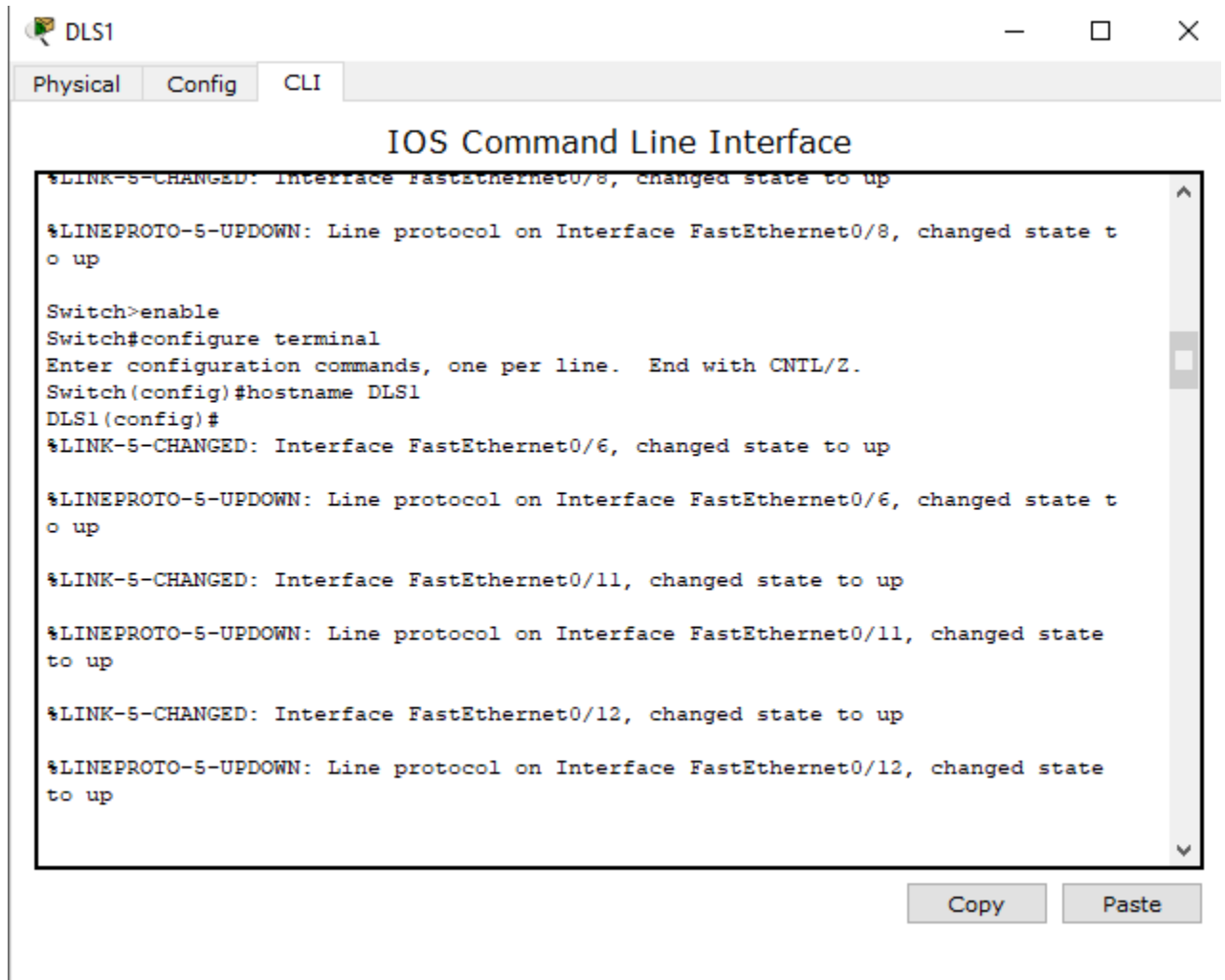
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively do
wn
```

At the bottom right of the terminal window, there are "Copy" and "Paste" buttons.

Se apaga las interfaces del switch ASL2

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

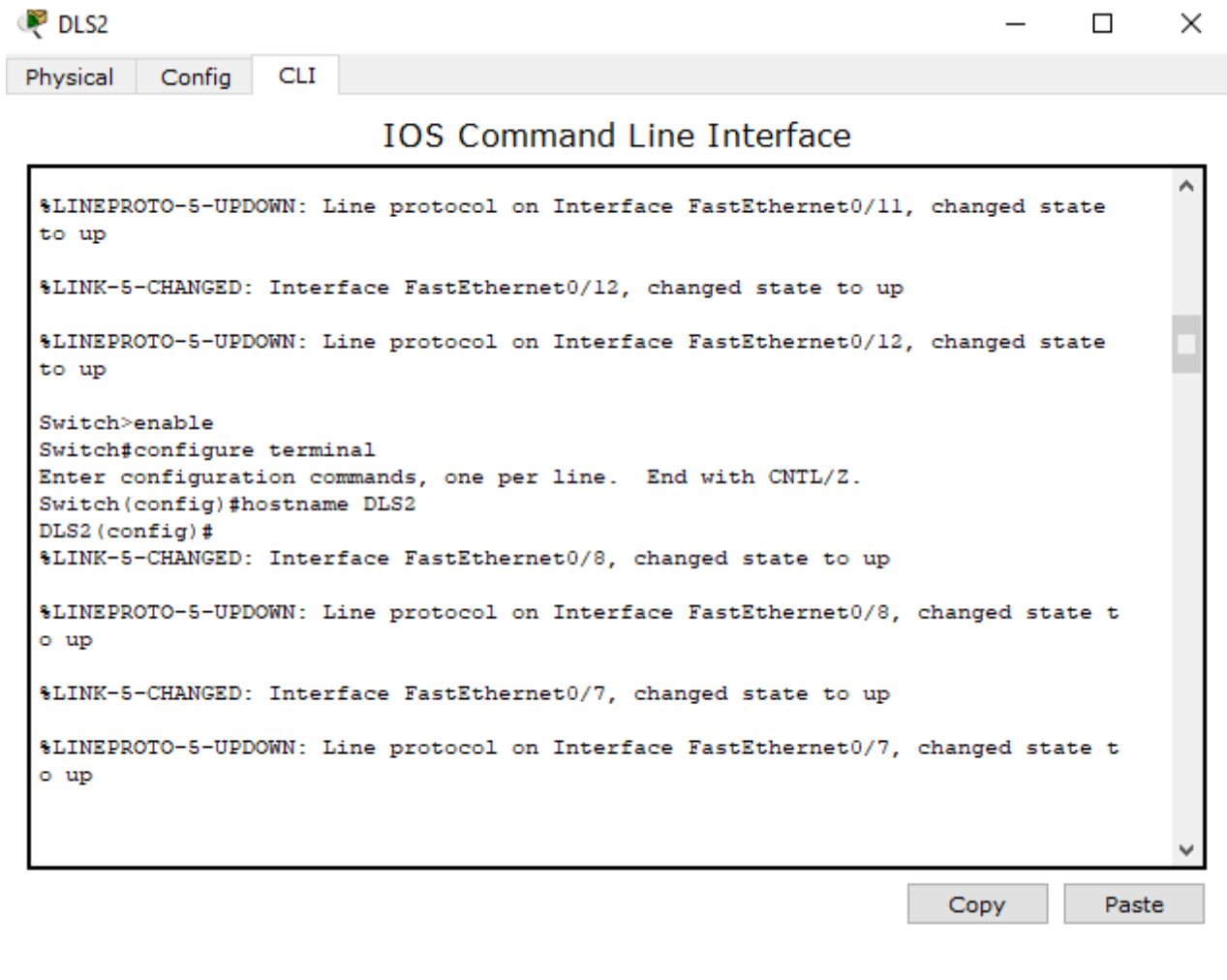
Figura 20. Correcta configuración de DLS1



```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS1
DLS1(config)#
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up
Switch#enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS1
DLS1(config)#
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%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
```

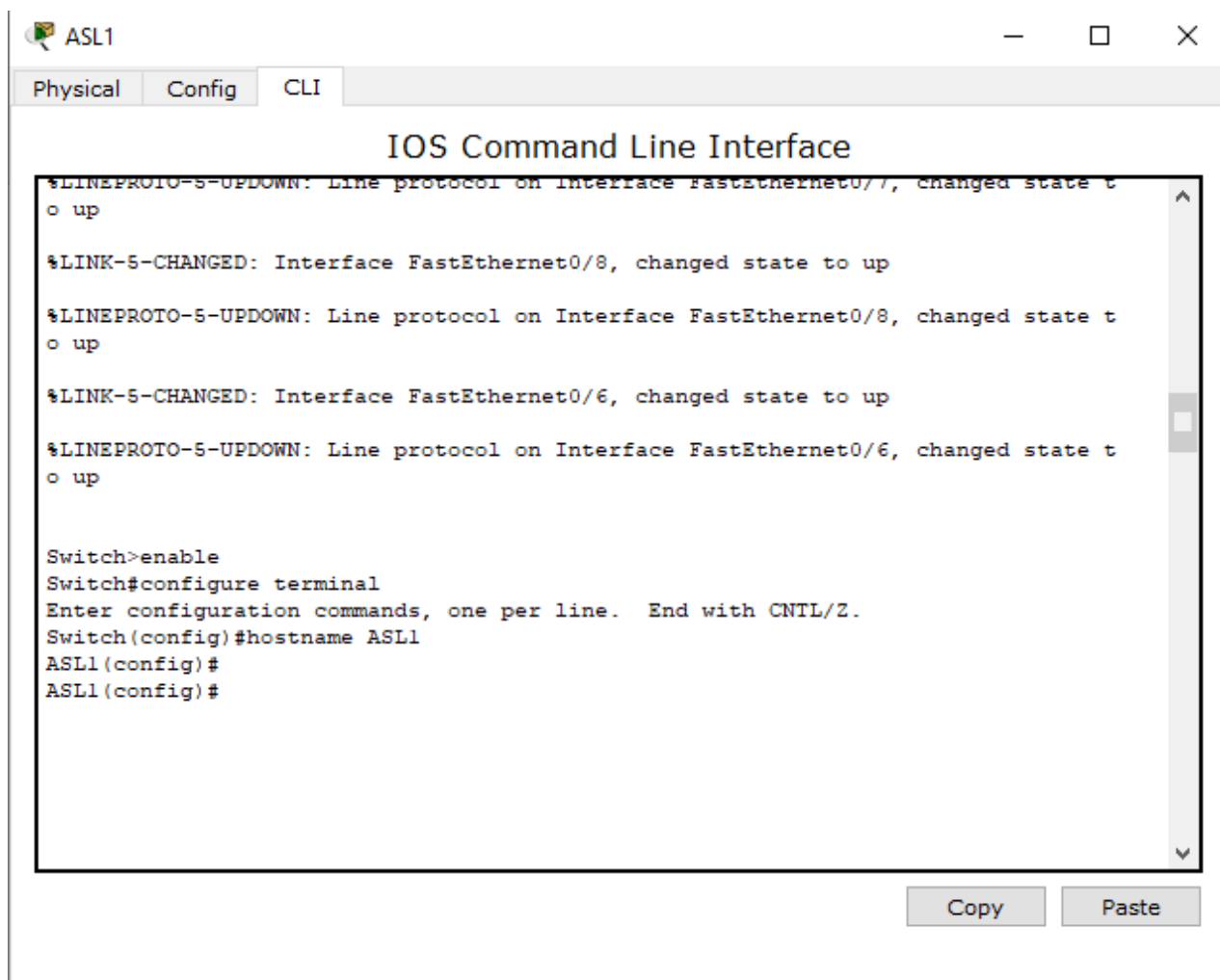
Cambio de nombre del switch DLS1.

Figura 21. Correcta configuración de DLS2



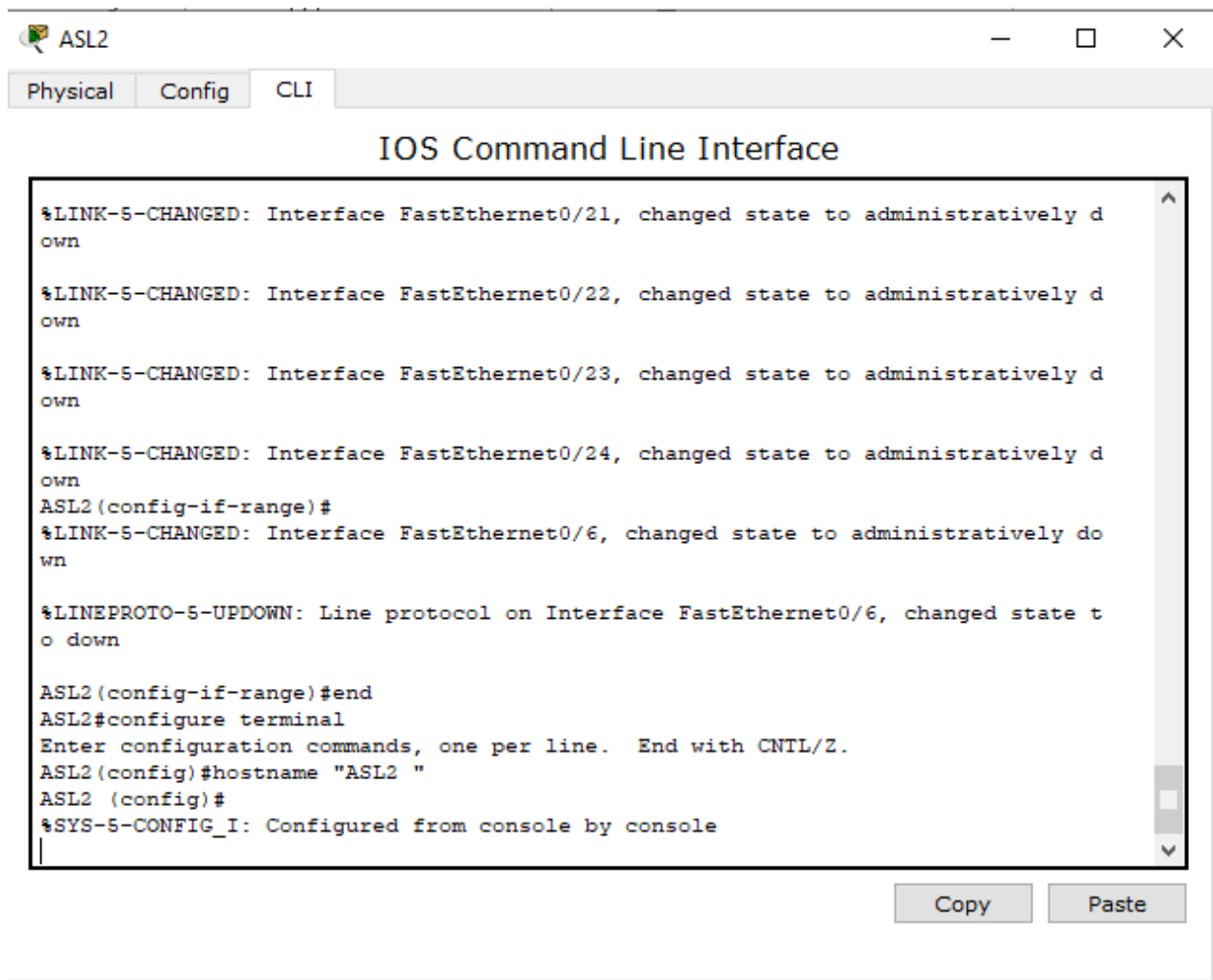
Cambio de nombre del switch DLS2

Figura 22. Correcta configuración de ASL1



Cambio de nombre del switch ASL1

Figura 23. Correcta configuración de ASL2



Cambio de nombre del switch ASL2 se dejó la misma imagen ya que se realizó el proceso de configuración con los 4 switch esta primera parte.

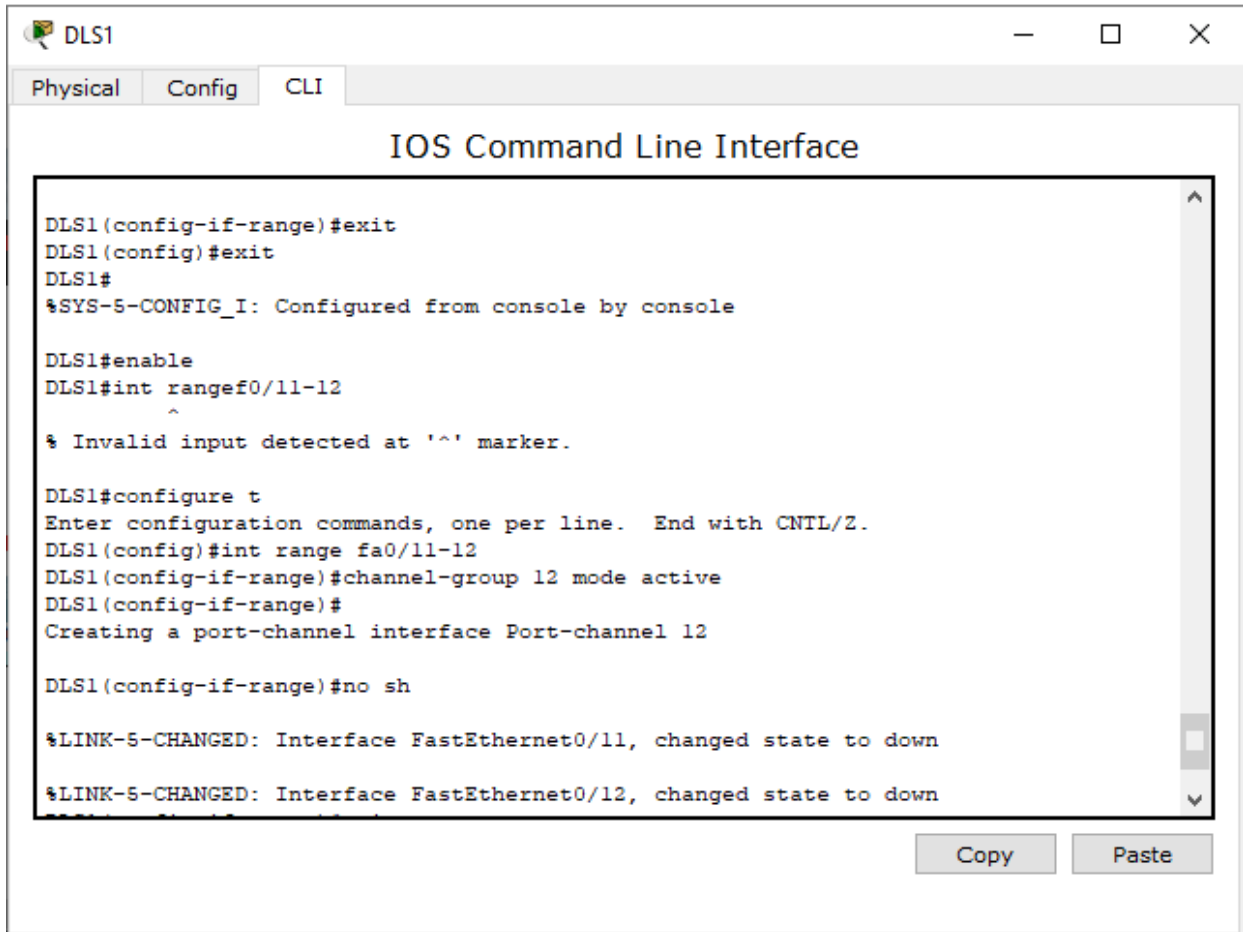
- c. Configurar los puertos troncales y Port-channels tal como se muestra en el diagrama.
 - 1) La conexión entre DLS1 y DLS2 será un EtherChannel capa-3 utilizando LACP. Para DLS1 se utilizará la dirección IP 10.12.12.1/30 y para DLS2 utilizará 10.12.12.2/30.

Se ejecuta comando cada sw:

DLS1>en

```
DLS1#conf ter
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)#channel-group 12 mode active
DLS1(config-if-range)#exit
```

Figura 24. Aplicando código DLS1 Port-channels



```
DLS1
Physical Config CLI
IOS Command Line Interface

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

DLS1#enable
DLS1#int range fa0/11-12
^
% Invalid input detected at '^' marker.

DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#int range fa0/11-12
DLS1(config-if-range)#channel-group 12 mode active
DLS1(config-if-range)#
Creating a port-channel interface Port-channel 12

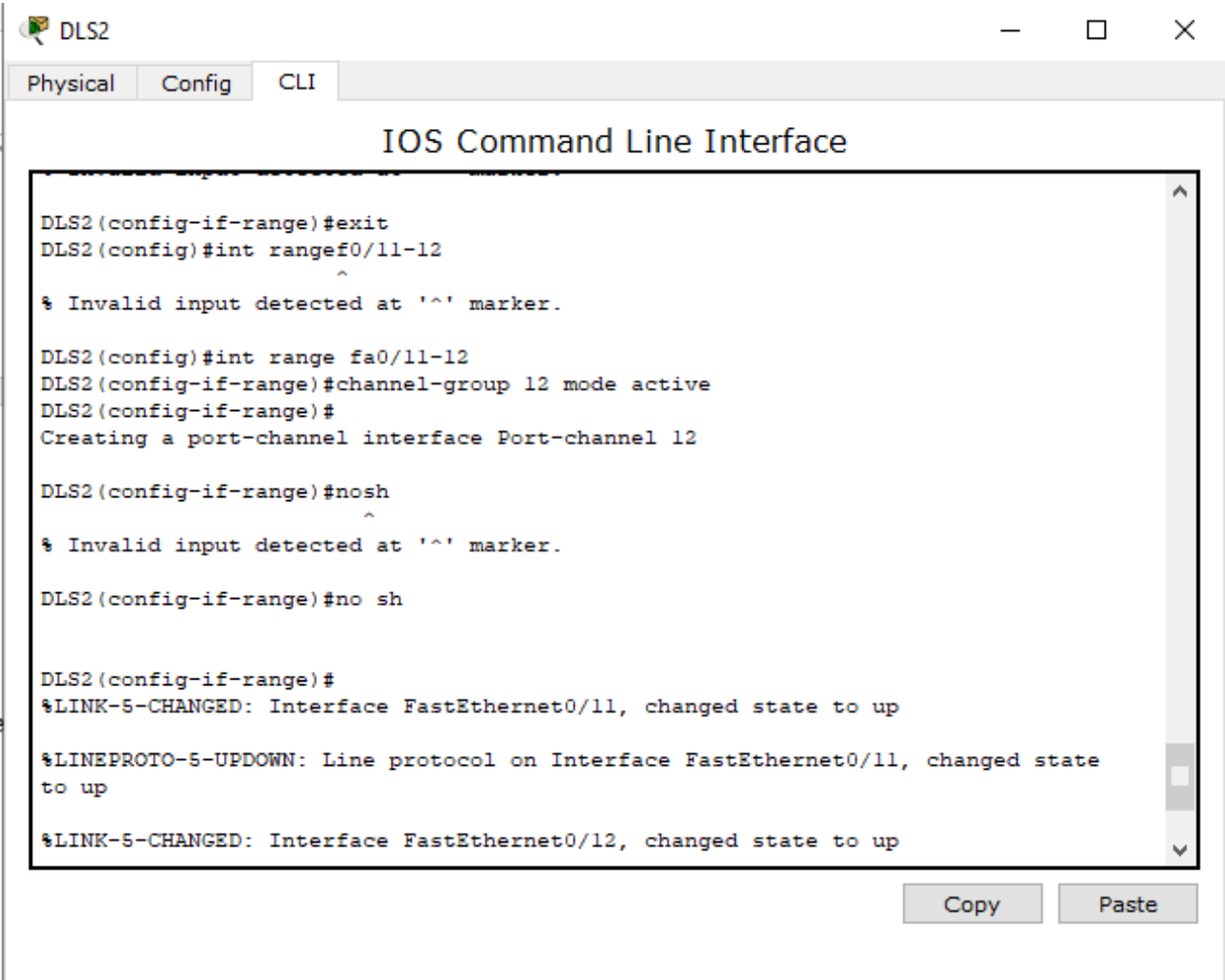
DLS1(config-if-range)#no sh

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to down

Copy Paste
```

```
DLS2>en
DLS2#conf ter
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)#exit
```

Figura 25. Aplicando código DLS2 Port-channels



```
DLS2
Physical Config CLI
IOS Command Line Interface

DLS2(config-if-range)#exit
DLS2(config)#int range f0/11-12
^
% Invalid input detected at '^' marker.

DLS2(config)#int range fa0/11-12
DLS2(config-if-range)#channel-group 12 mode active
DLS2(config-if-range)#
Creating a port-channel interface Port-channel 12

DLS2(config-if-range)#nosh
^
% Invalid input detected at '^' marker.

DLS2(config-if-range)#no sh

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

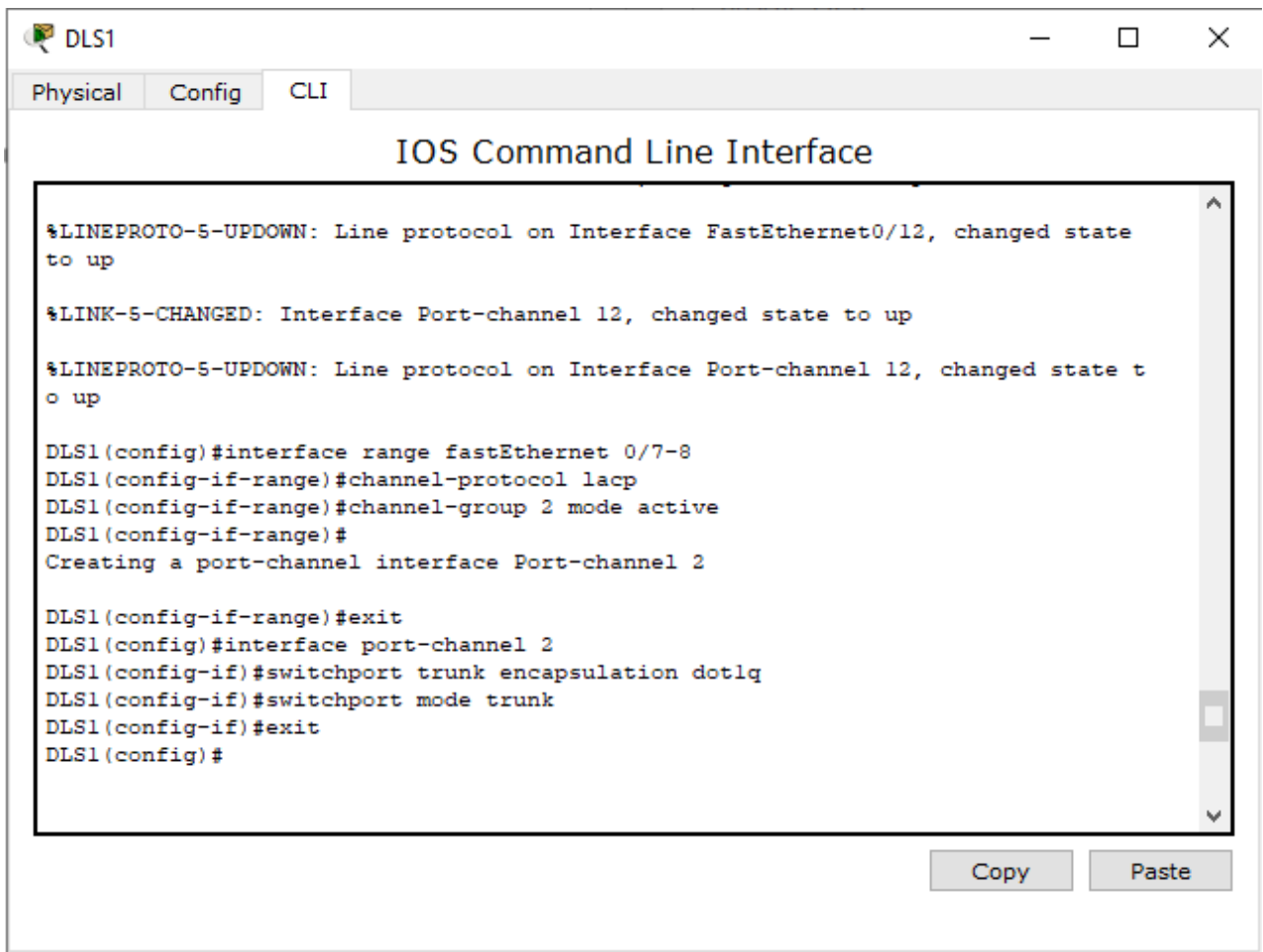
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to up

Copy Paste
```

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

DLS1

Figura 26. Aplicando código DLS1 LACP



```
DLS1(config)#interface range fastEthernet 0/7-8
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)#exit
DLS1(config)#interface port-channel 2
DLS1(config-if)#switchport trunk encapsulation dot1q
DLS1(config-if)#switchport mode trunk
DLS1(config-if)#exit
DLS1(config)#
```

DLS2

```
DLS2>ENABLE
```

```
DLS2#CONFIGURE T
```

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

```
DLS2(config)#INTERFACE RANGE FASTETHERNET 0/7-8
```

```
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)#EXIT
```

```
DLS2(config)#INTERFACE PORT-CHANNEL 2
```

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

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

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

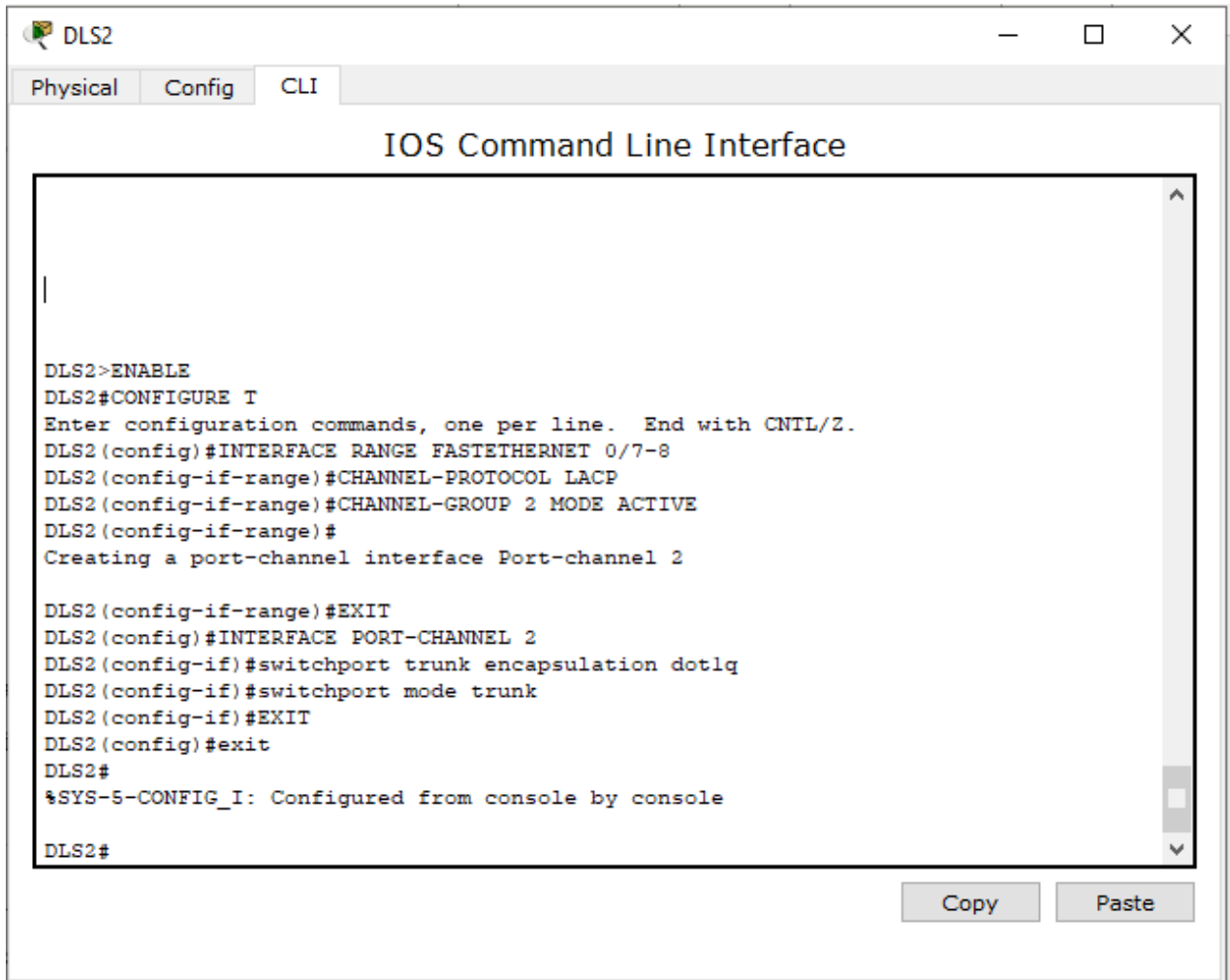
```
DLS2(config)#exit
```

```
DLS2#
```

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

DLS2#

Figura 27. Aplicando código DLS2 LACP



The screenshot shows a terminal window titled "DLS2" with tabs for "Physical", "Config", and "CLI". The main area is labeled "IOS Command Line Interface". The terminal output shows the following commands and responses:

```
DLS2>ENABLE
DLS2#CONFIGURE T
Enter configuration commands, one per line. End with CNTL/Z.
DLS2 (config)#INTERFACE RANGE FASTETHERNET 0/7-8
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)#EXIT
DLS2 (config)#INTERFACE PORT-CHANNEL 2
DLS2 (config-if)#switchport trunk encapsulation dot1q
DLS2 (config-if)#switchport mode trunk
DLS2 (config-if)#EXIT
DLS2 (config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
DLS2#
```

At the bottom right of the terminal window, there are "Copy" and "Paste" buttons.

ALS1

ALS1>enable

ALS1#cnfigure t

^

% Invalid input detected at '^' marker.

```
ALS1#configure t
```

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

```
ALS1(config)#interface range fastethernet 0/7-8
```

```
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
```

```
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
```

```
ALS1(config-if-range)#exit
```

```
ALS1(config)#interface port-channel 2
```

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

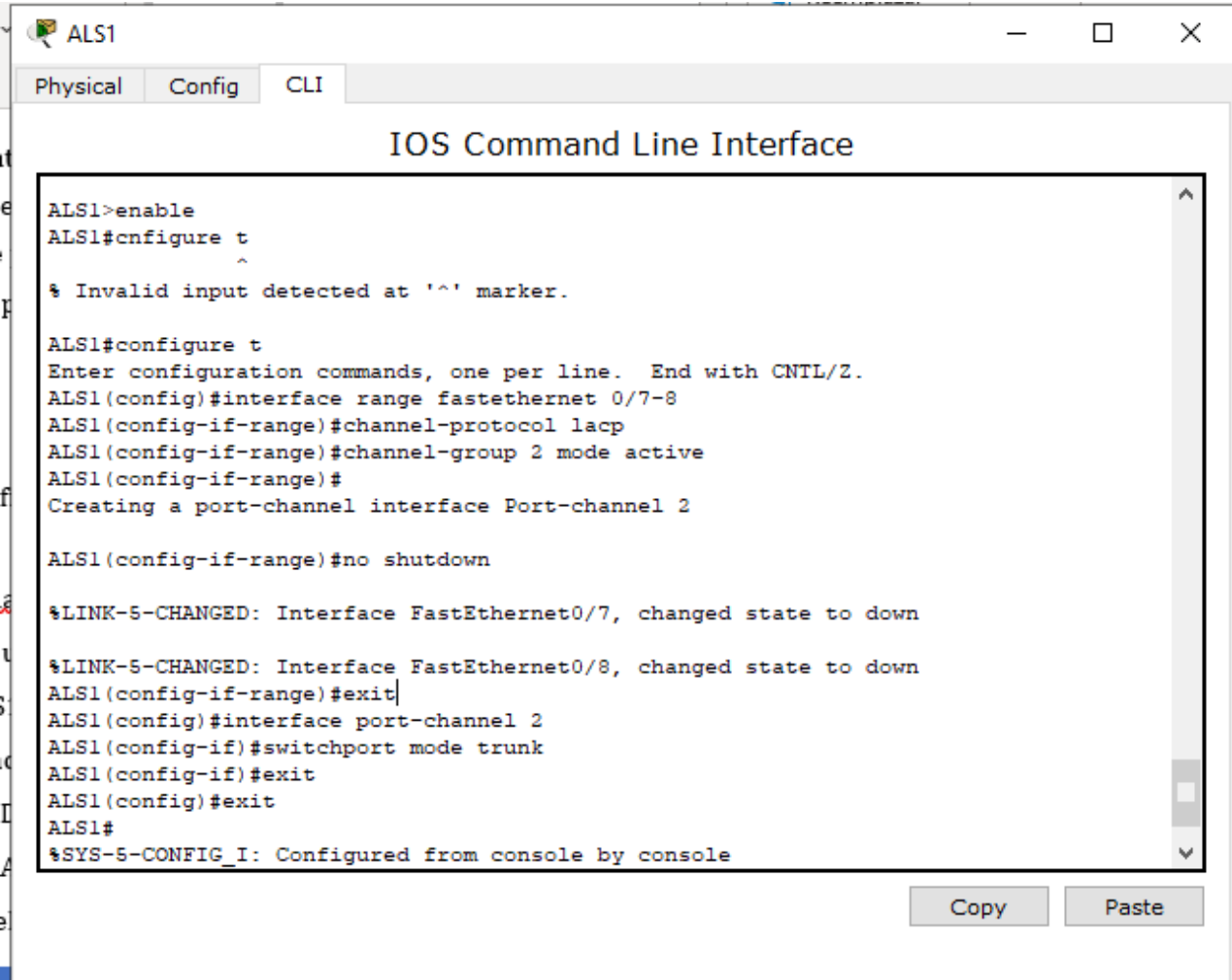
```
ALS1(config-if)#exit
```

```
ALS1(config)#exit
```

```
ALS1#
```

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

Figura 28. Aplicando código ALS1 LACP



The screenshot shows a terminal window titled 'ALS1' with tabs for 'Physical', 'Config', and 'CLI'. The main content is the 'IOS Command Line Interface' where the following commands and messages are displayed:

```
ALS1>enable
ALS1#configure t
^
% Invalid input detected at '^' marker.

ALS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#interface range fastEthernet 0/7-8
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

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
ALS1(config-if-range)#exit
ALS1(config)#interface port-channel 2
ALS1(config-if)#switchport mode trunk
ALS1(config-if)#exit
ALS1(config)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom right of the terminal window, there are 'Copy' and 'Paste' buttons.

ALS2

ALS2>enable

ALS2#configure t

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

ALS2(config)#interface range fastEthernet 0/7-8

ALS2(config-if-range)#channel-protocol lacp

ALS2(config-if-range)#channel-group 2 mode active

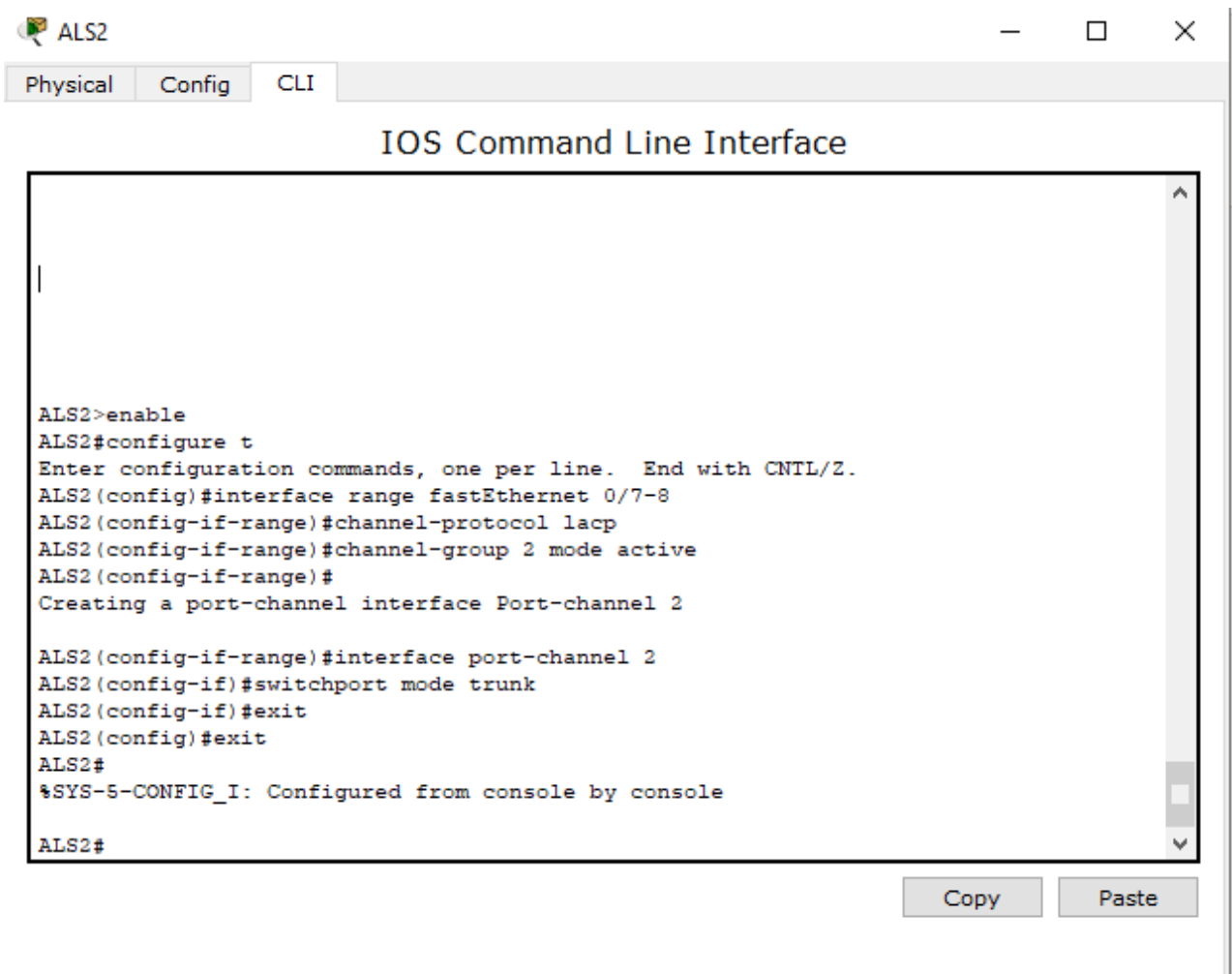
ALS2(config-if-range)#

Creating a port-channel interface Port-channel 2

```
ALS2(config-if-range)#interface port-channel 2
ALS2(config-if)#switchport mode trunk
ALS2(config-if)#exit
ALS2(config)#exit
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

ALS2#
```

Figura 29. Aplicando código ASL2 LACP



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

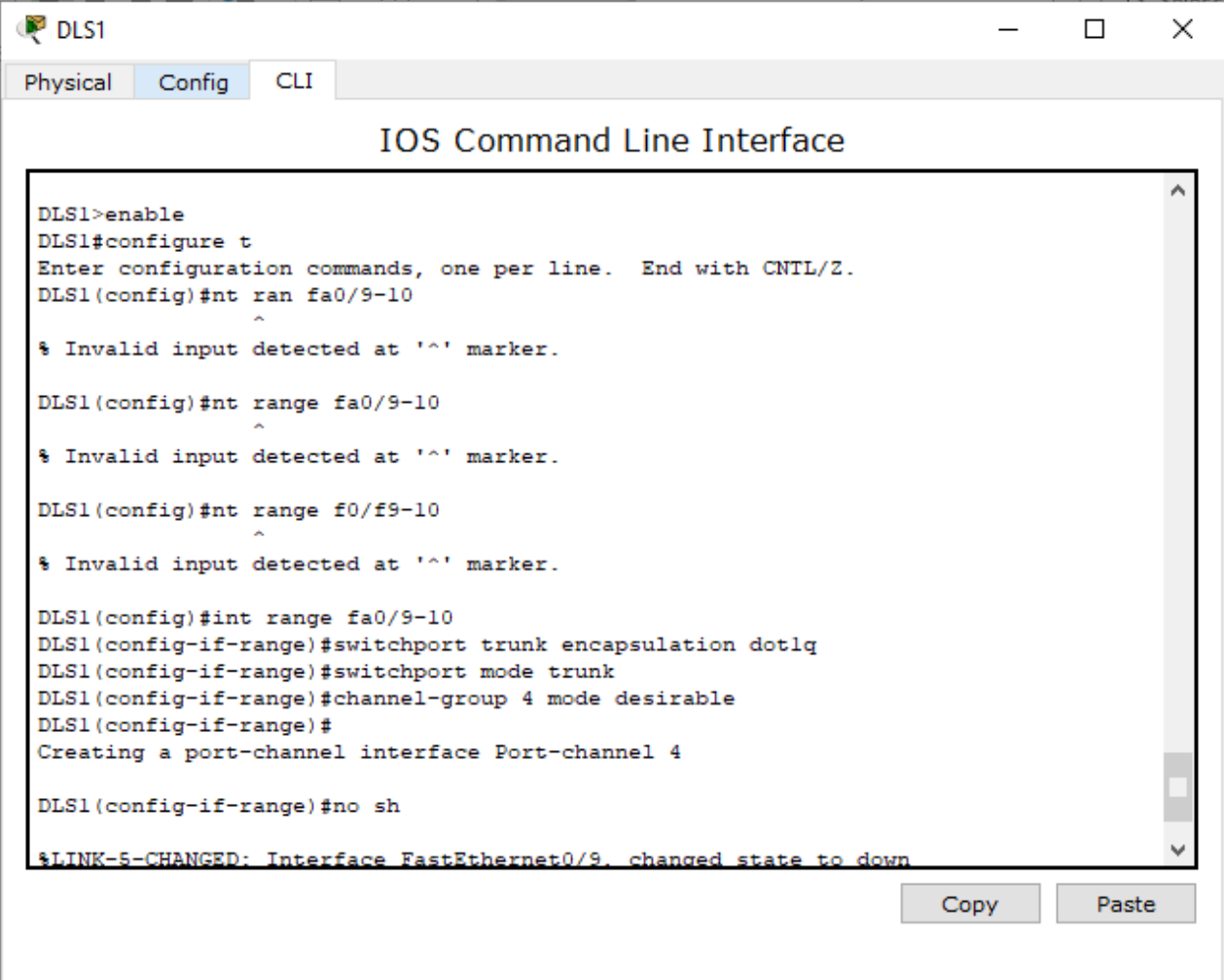
```
DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#int range fa0/9-10
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#channel-group 4 mode desirable
DLS1(config-if-range)#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

DLS1(config-if-range)#no sh

%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)#
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 30. Aplicando código DLS1 PAgP



```
DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#nt ran fa0/9-10
      ^
% Invalid input detected at '^' marker.

DLS1(config)#nt range fa0/9-10
      ^
% Invalid input detected at '^' marker.

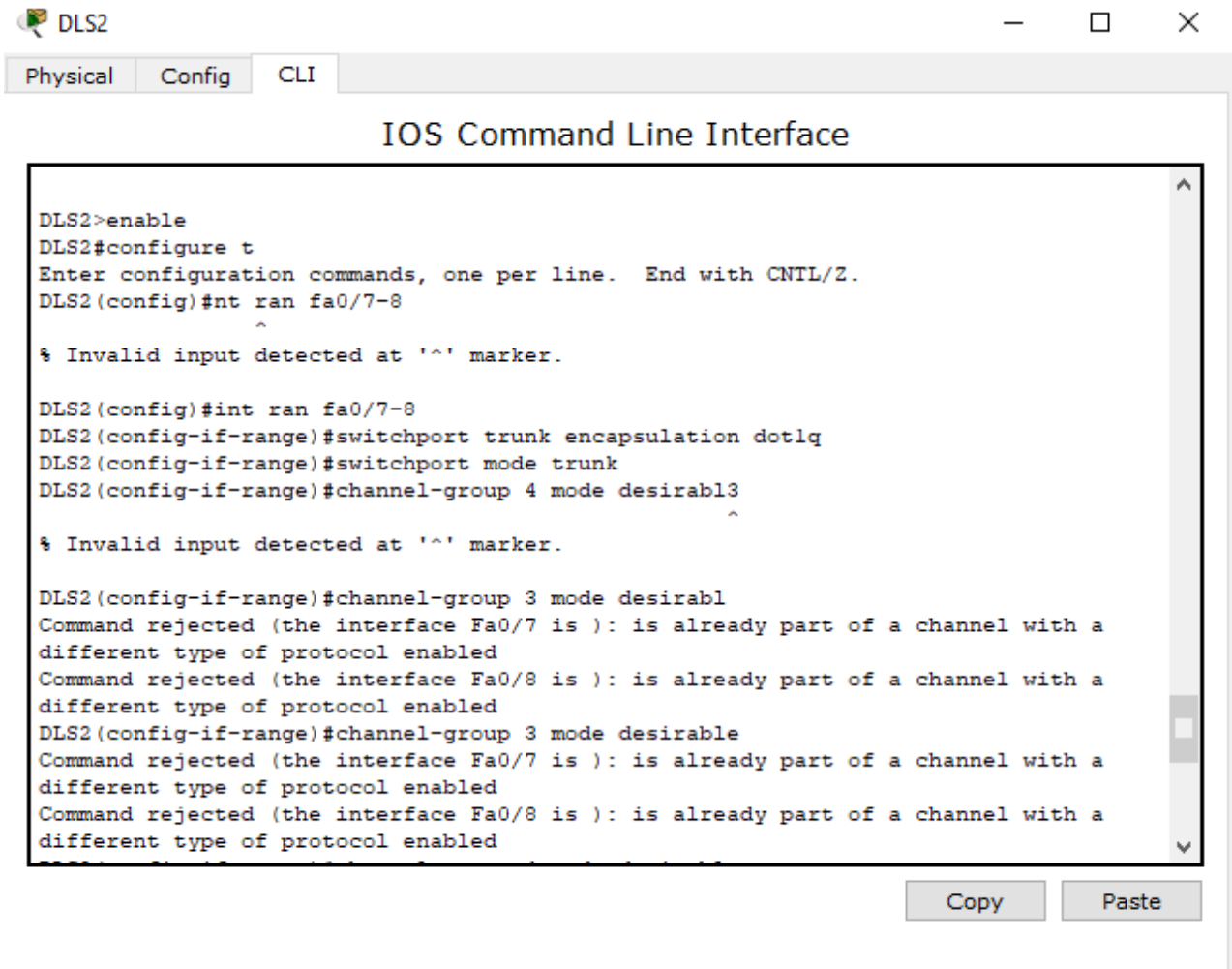
DLS1(config)#nt range f0/f9-10
      ^
% Invalid input detected at '^' marker.

DLS1(config)#int 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 sh

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to down
```

Figura 31. Aplicando código DLS2 PAgP



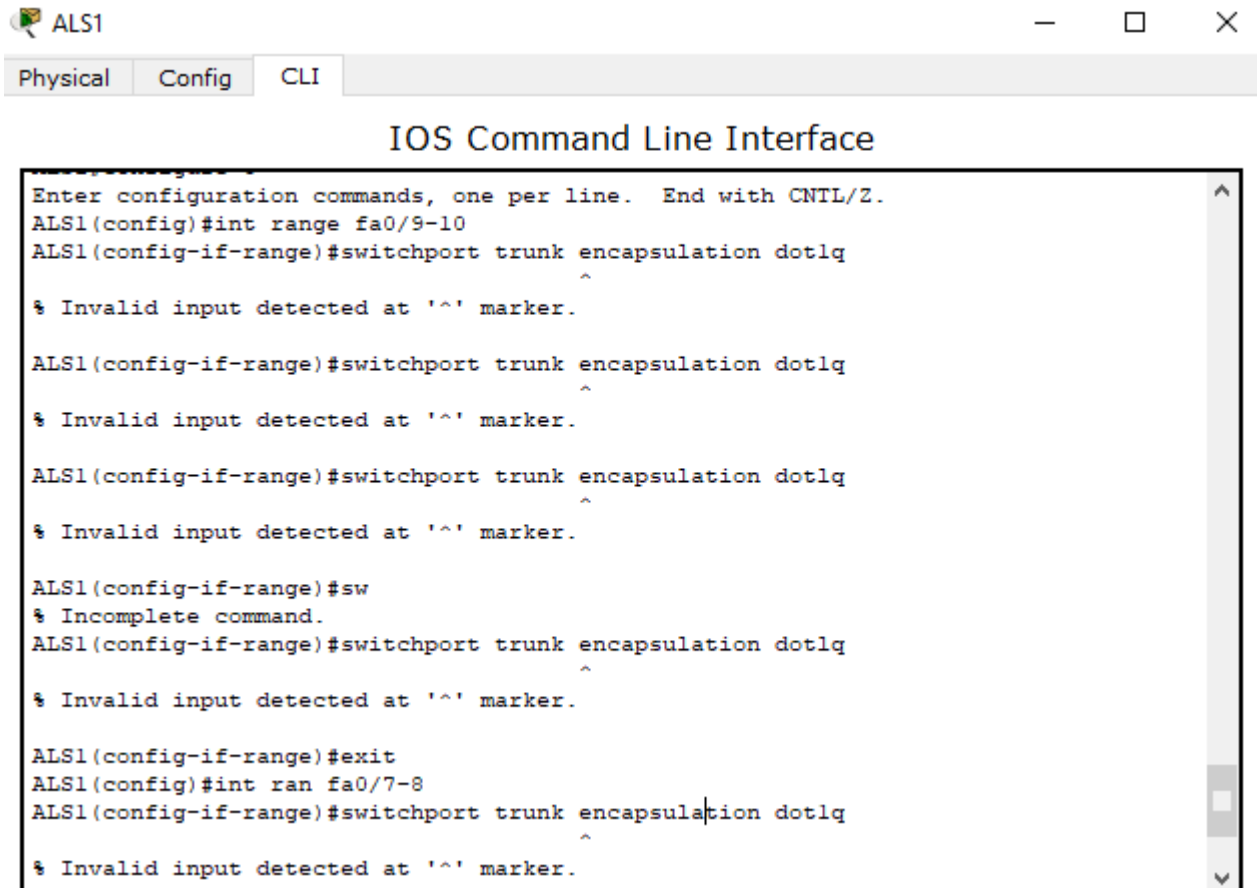
```
DLS2>enable
DLS2#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#nt ran fa0/7-8
      ^
% Invalid input detected at '^' marker.

DLS2(config)#int ran fa0/7-8
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#channel-group 4 mode desirable3
      ^
% Invalid input detected at '^' marker.

DLS2(config-if-range)#channel-group 3 mode desirable
Command rejected (the interface Fa0/7 is ): is already part of a channel with a
different type of protocol enabled
Command rejected (the interface Fa0/8 is ): is already part of a channel with a
different type of protocol enabled
DLS2(config-if-range)#channel-group 3 mode desirable
Command rejected (the interface Fa0/7 is ): is already part of a channel with a
different type of protocol enabled
Command rejected (the interface Fa0/8 is ): is already part of a channel with a
different type of protocol enabled
```

Copy Paste

Figura 32. Aplicando código ASL1 PAgP



The screenshot shows a window titled 'ALS1' with three tabs: 'Physical', 'Config', and 'CLI'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The interface shows a series of configuration commands and their corresponding error messages:

```
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#int range fa0/9-10
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS1(config-if-range)#sw
% Incomplete command.
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS1(config-if-range)#exit
ALS1(config)#int ran fa0/7-8
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
```

Figura 33. Aplicando código ASL2 PAGP

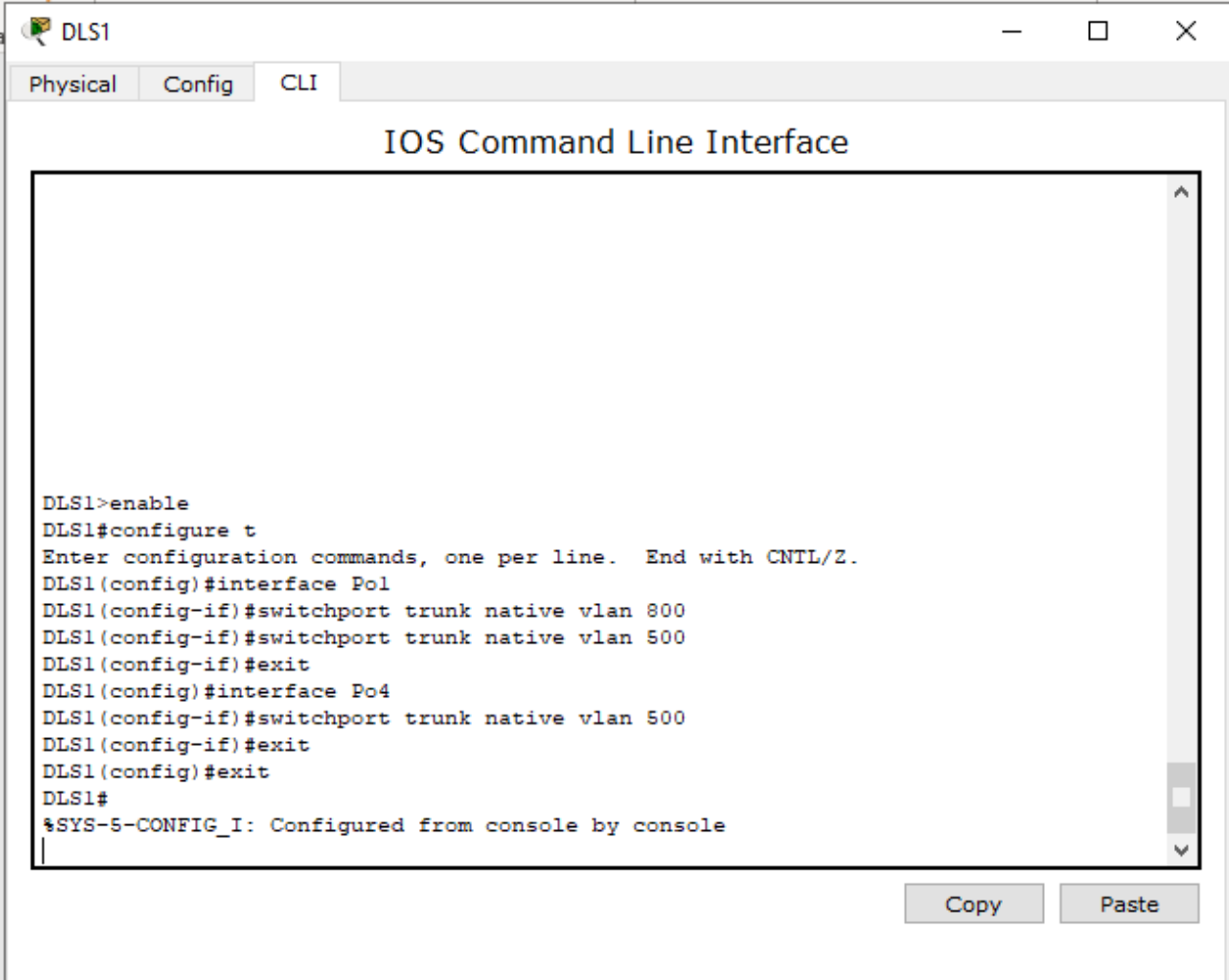
```
ALS2>enable
ALS2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#int ran fa0/7-8
ALS2(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.

ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#channel-group 4 mode desirable
Command rejected (the interface Fa0/7 is ): is already part of a channel with a
different type of protocol enabled
Command rejected (the interface Fa0/8 is ): is already part of a channel with a
different type of protocol enabled
ALS2(config-if-range)#channel-group 4 mode desirable
Command rejected (the interface Fa0/7 is ): is already part of a channel with a
different type of protocol enabled
Command rejected (the interface Fa0/8 is ): is already part of a channel with a
different type of protocol enabled
ALS2(config-if-range)#no sh

ALS2(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
```

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

Figura 34. Aplicando código DLS1 VLAN 500



```
DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface Po1
DLS1(config-if)#switchport trunk native vlan 800
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
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 35. Aplicando código DLS2 VLAN 500

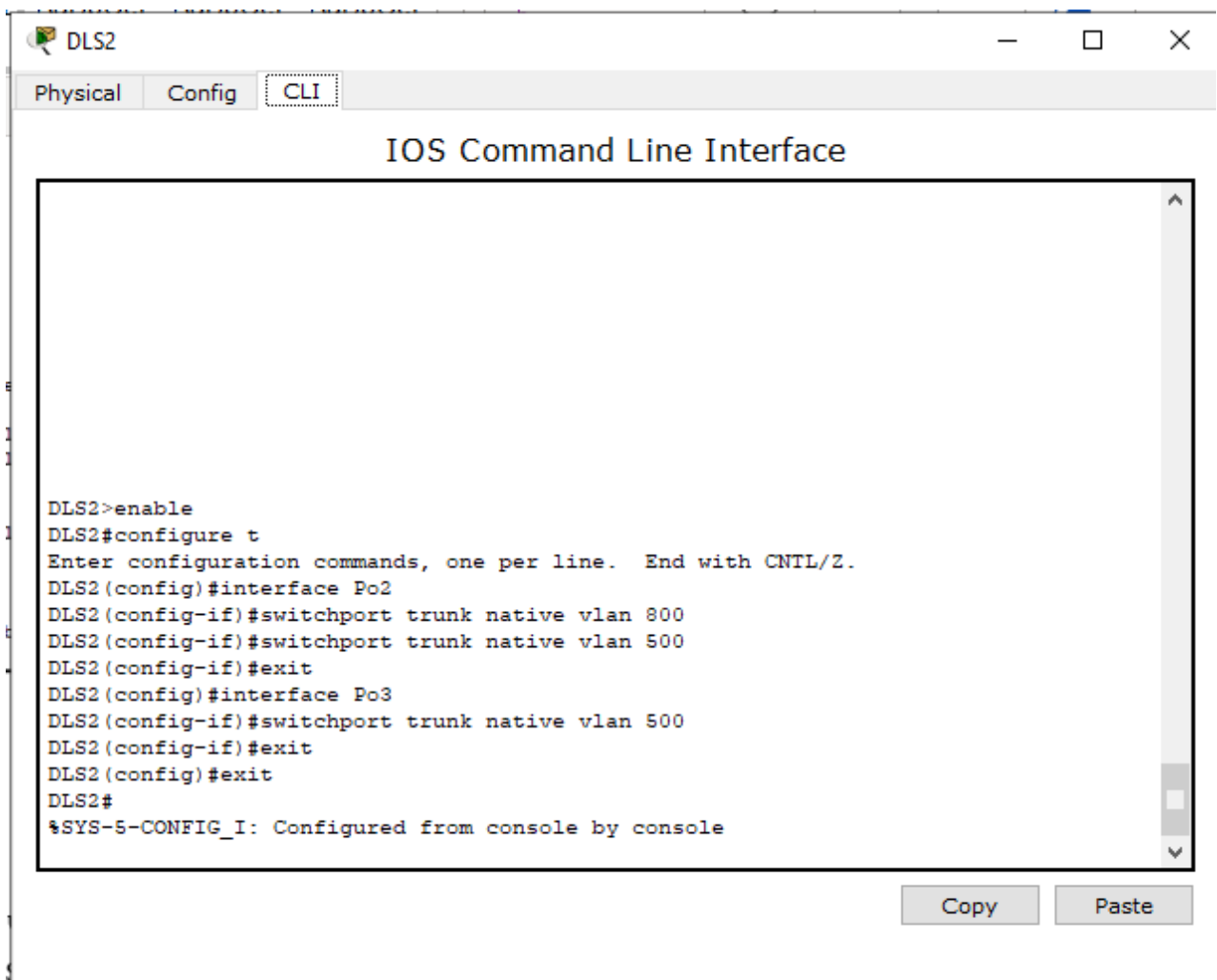
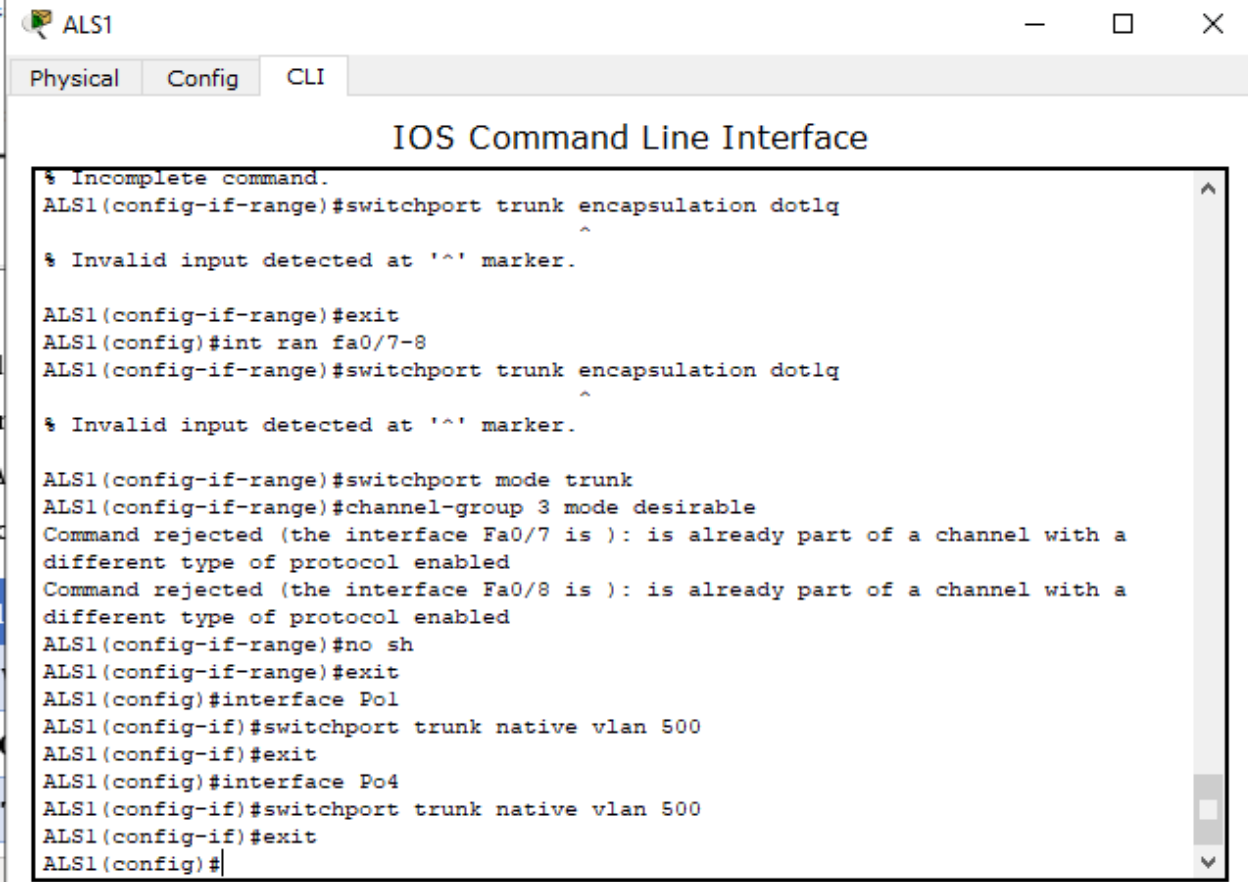


Figura 36. Aplicando código ASL1 VLAN 500



The screenshot shows a window titled 'ALS1' with three tabs: 'Physical', 'Config', and 'CLI'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following sequence of commands and responses:

```
% Incomplete command.
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.

ALS1(config-if-range)#exit
ALS1(config)#int ran fa0/7-8
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
Command rejected (the interface Fa0/7 is ): is already part of a channel with a
different type of protocol enabled
Command rejected (the interface Fa0/8 is ): is already part of a channel with a
different type of protocol enabled
ALS1(config-if-range)#no sh
ALS1(config-if-range)#exit
ALS1(config)#interface Po1
ALS1(config-if)#switchport trunk native vlan 500
ALS1(config-if)#exit
ALS1(config)#interface Po4
ALS1(config-if)#switchport trunk native vlan 500
ALS1(config-if)#exit
ALS1(config)#
```

Figura 37. Aplicando código ASL2 VLAN 500

```
ALS2
Physical Config CLI
IOS Command Line Interface
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
1), with DLS2 Port-channel 2 (500).

ALS2>enable
ALS2#configure t
^
% Invalid input detected at '^' marker.

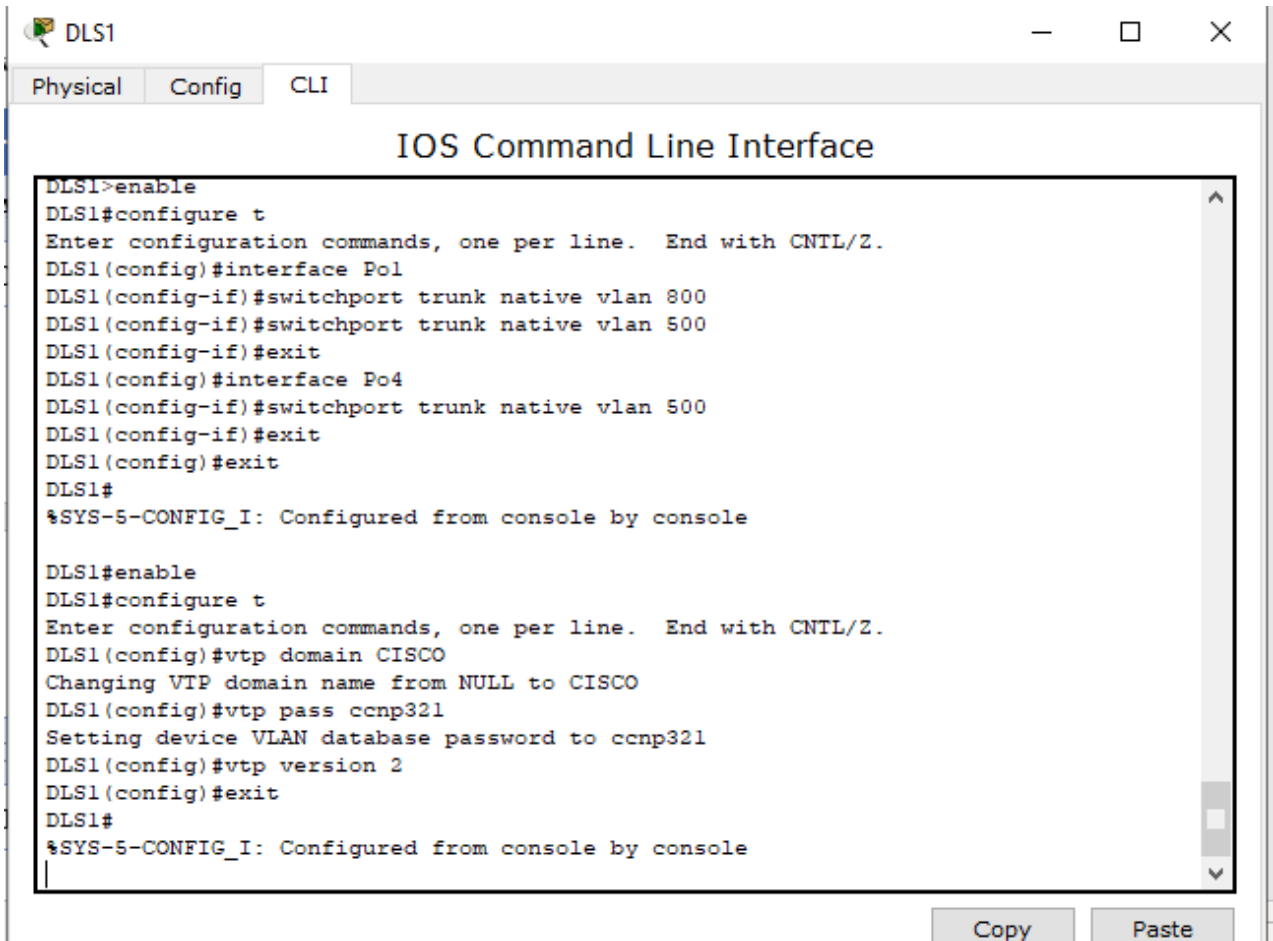
ALS2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#interface Po2
ALS2(config-if)#switchport trunk native vlan 500
ALS2(config-if)#interface Po3
ALS2(config-if)#switchport trunk native vlan 500
ALS2(config-if)#switchport trunk native vlan 500
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with DLS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with DLS2 FastEthernet0/8 (1).
exit
^
% Invalid input detected at '^' marker.

ALS2(config-if)#exit
ALS2(config)#
```

- d. Configurar DLS1, ALS1, y ALS2 para utilizar VTP versión 3
 - 1) Utilizar el nombre de dominio CISCO con la contraseña ccnp321

Figura 38. Aplicando código DLS1 VTP versión 3



The screenshot shows a Cisco IOS Command Line Interface window titled "DLS1". The window has three tabs: "Physical", "Config", and "CLI", with "CLI" selected. The main content area displays the following commands and their outputs:

```
DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface Po1
DLS1(config-if)#switchport trunk native vlan 800
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
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#enable
DLS1#configure 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 pass ccnp321
Setting device VLAN database password to ccnp321
DLS1(config)#vtp version 2
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom right of the window, there are "Copy" and "Paste" buttons.

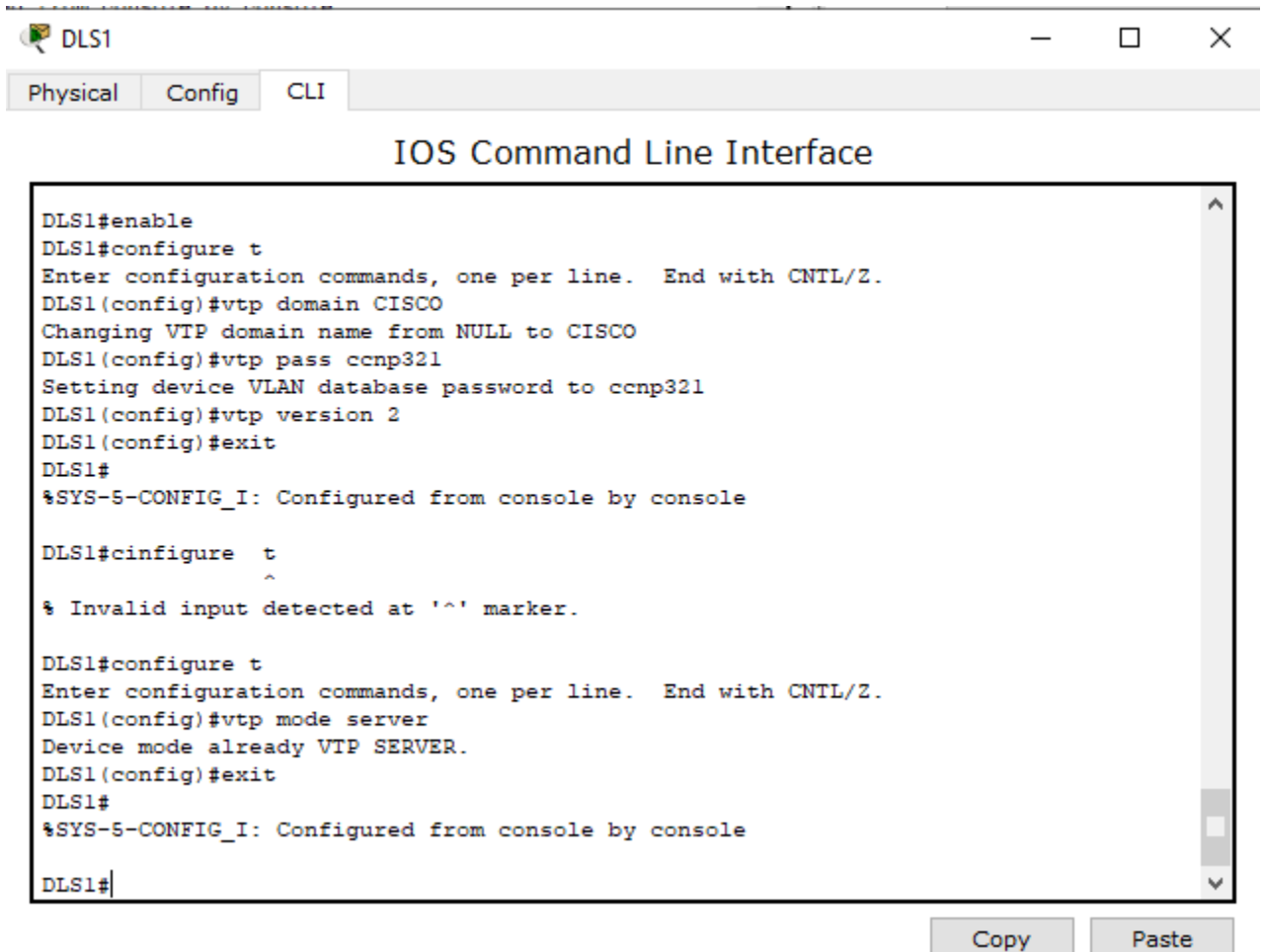
Figura 39. Aplicando código ASL1 VTP versión 3

```
ALS1>enable
ALS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
ALS1(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
ALS1(config)#vtp version 3
^
% Invalid input detected at '^' marker.

ALS1(config)#vtp version 2
Cannot modify version in VTP client mode
ALS1(config)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console
```

2) Configurar DLS1 como servidor principal para las VLAN.

Figura 40. Aplicando código DLS1 VLAN principal



The screenshot shows a Cisco IOS Command Line Interface window titled "DLS1". The window has tabs for "Physical", "Config", and "CLI". The main content area displays the following text:

```
DLS1#enable
DLS1#configure 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 pass ccnp321
Setting device VLAN database password to ccnp321
DLS1(config)#vtp version 2
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#cinfigure t
^
% Invalid input detected at '^' marker.

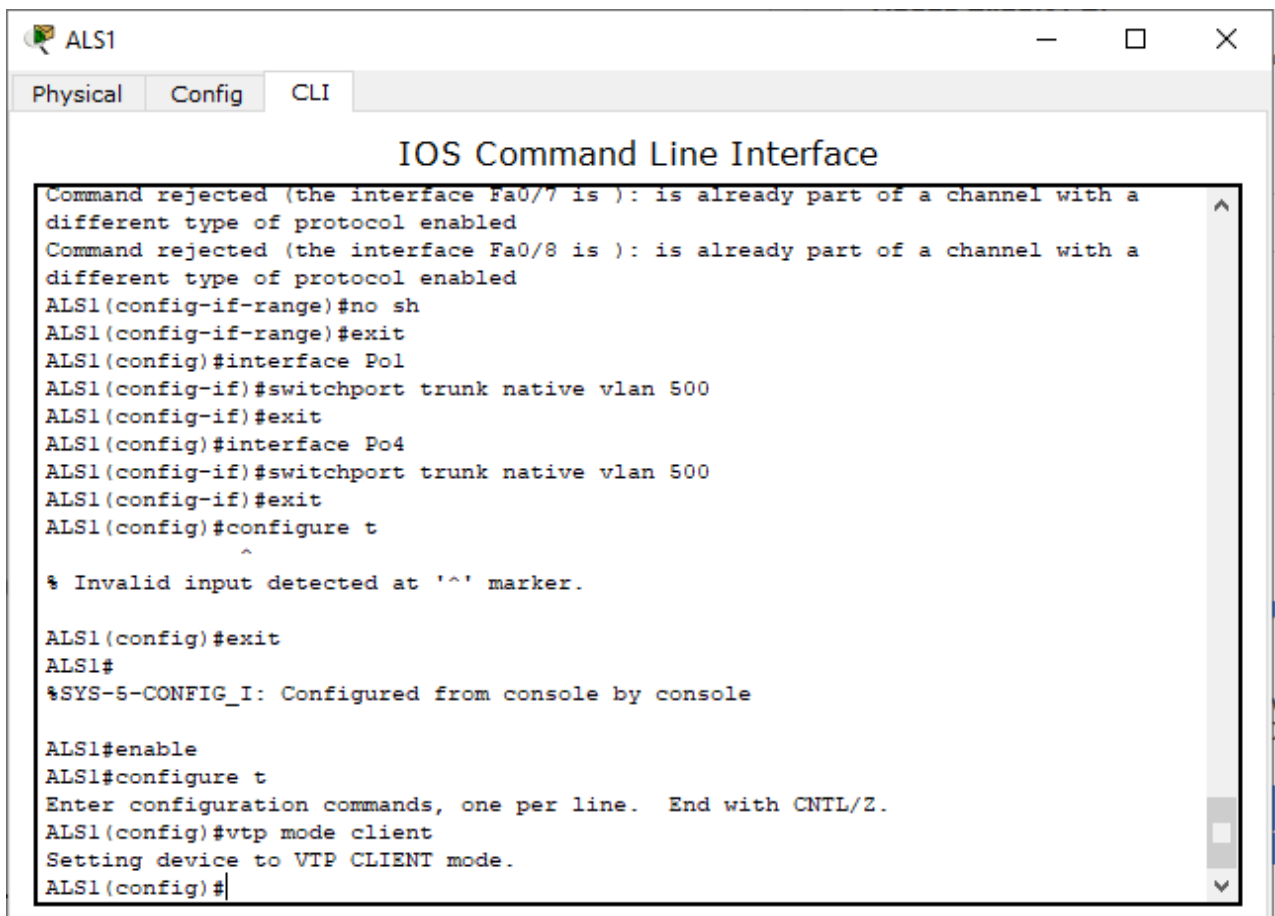
DLS1#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#vtp mode server
Device mode already VTP SERVER.
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#
```

At the bottom right of the window, there are "Copy" and "Paste" buttons.

3) Configurar ALS1 y ALS2 como clientes VTP.

Figura 41. Aplicando código ASL1 clientes VTP



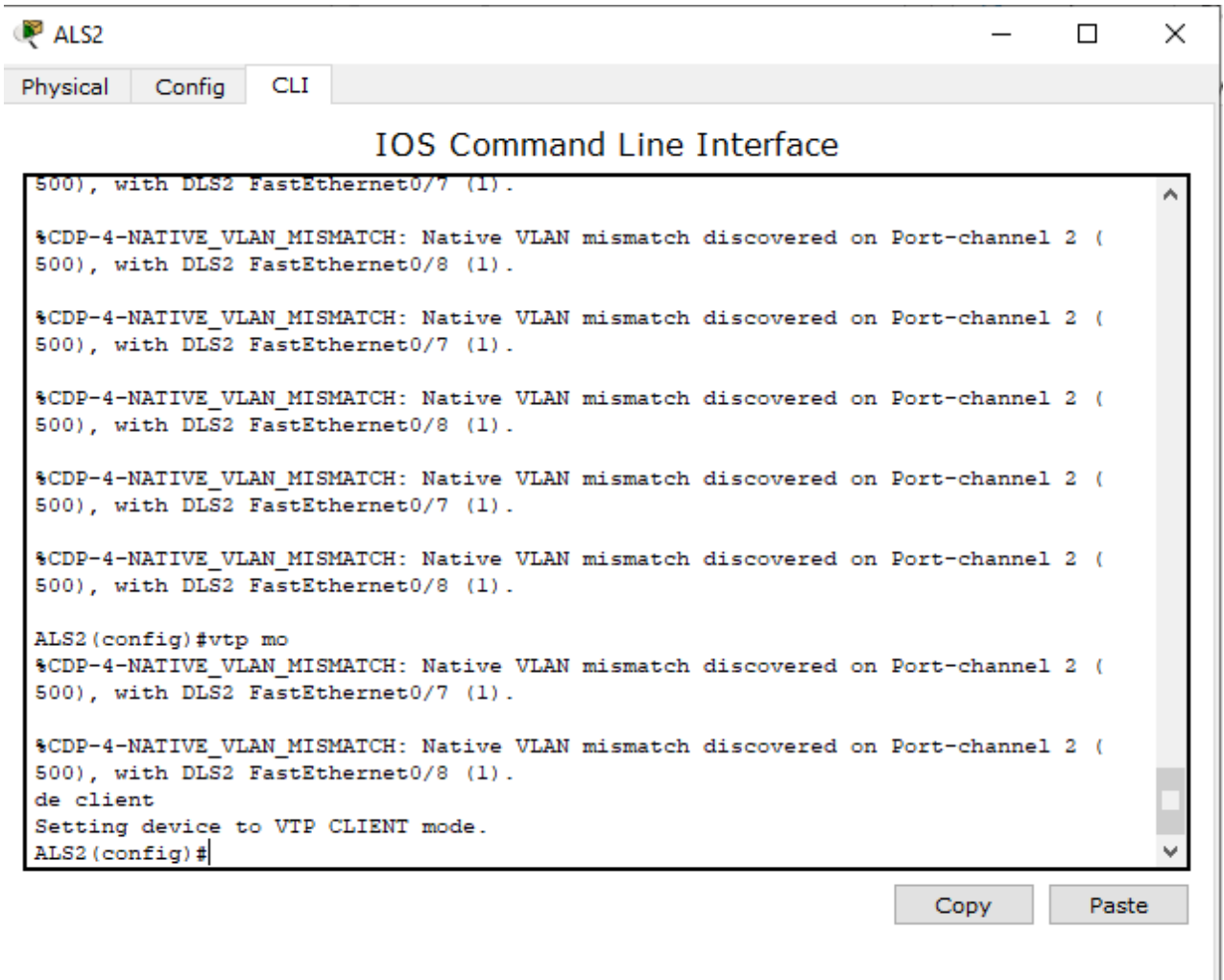
The screenshot shows a terminal window titled 'ALS1' with tabs for 'Physical', 'Config', and 'CLI'. The main content is the 'IOS Command Line Interface' showing the following sequence of commands and responses:

```
Command rejected (the interface Fa0/7 is ): is already part of a channel with a
different type of protocol enabled
Command rejected (the interface Fa0/8 is ): is already part of a channel with a
different type of protocol enabled
ALS1(config-if-range)#no sh
ALS1(config-if-range)#exit
ALS1(config)#interface Po1
ALS1(config-if)#switchport trunk native vlan 500
ALS1(config-if)#exit
ALS1(config)#interface Po4
ALS1(config-if)#switchport trunk native vlan 500
ALS1(config-if)#exit
ALS1(config)#configure t
^
% Invalid input detected at '^' marker.

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

ALS1#enable
ALS1#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#vtp mode client
Setting device to VTP CLIENT mode.
ALS1(config)#
```

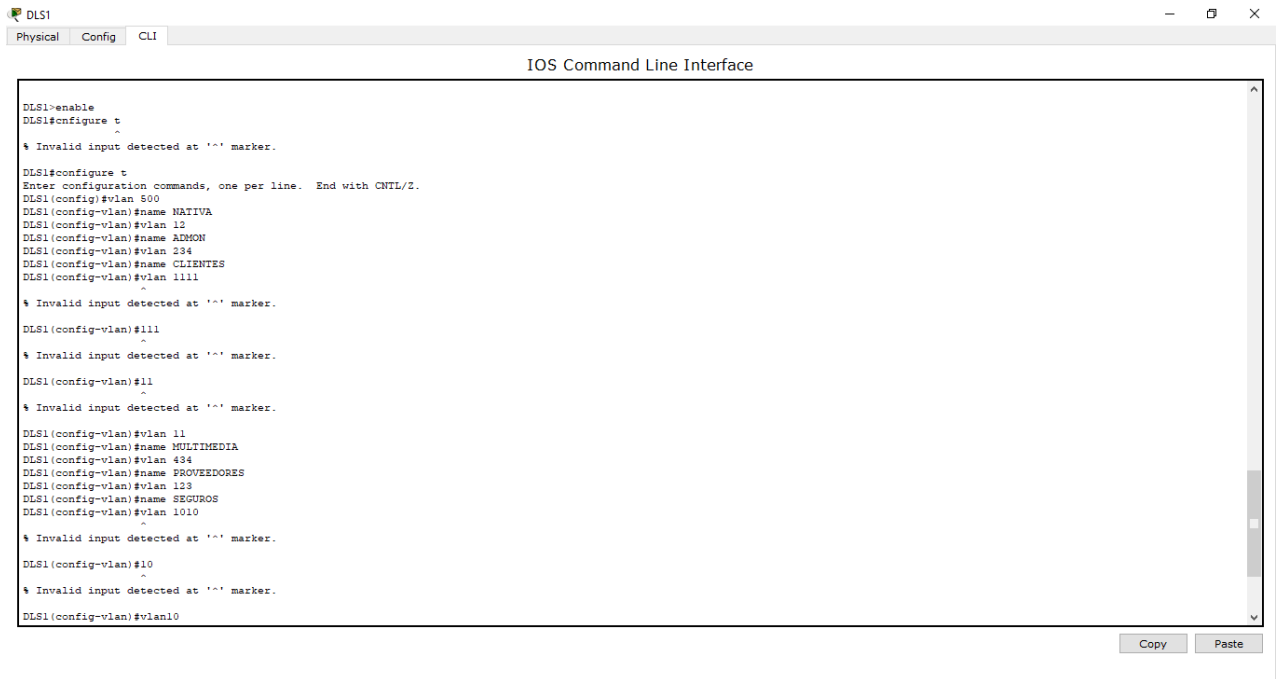
Figura 42. Aplicando código ASL2 clientes VTP



e. Configurar en el servidor principal las siguientes 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

Figura 43. Aplicando código DLS1 VLAN

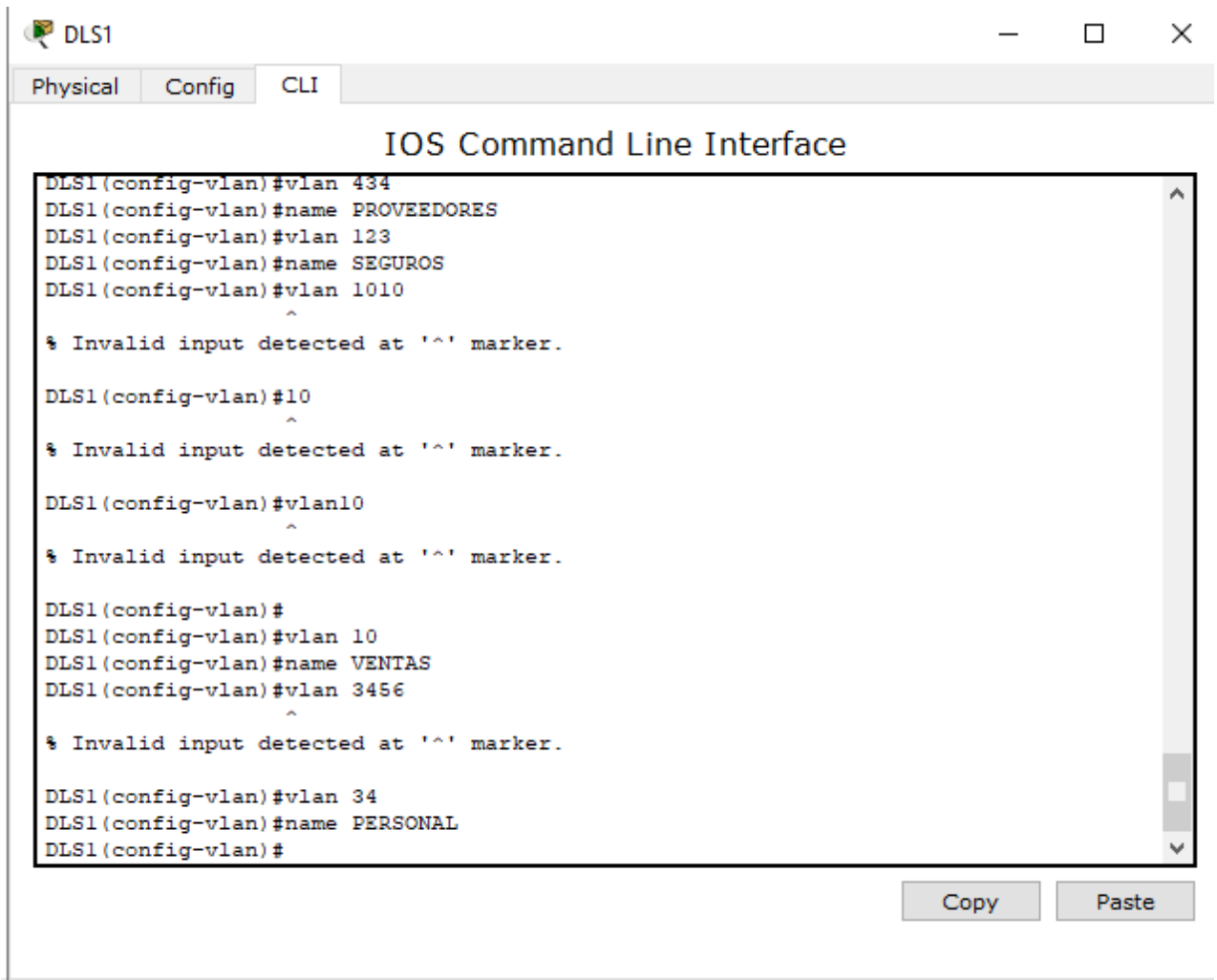


The screenshot shows a terminal window titled "DLS1" with tabs for "Physical", "Config", and "CLI". The main window is labeled "IOS Command Line Interface". The terminal output shows the following commands and responses:

```
DLS1>enable
DLS1#configure t
^
% Invalid input detected at '^' marker.
DLS1#configure 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 1111
^
% Invalid input detected at '^' marker.
DLS1(config-vlan)#111
^
% Invalid input detected at '^' marker.
DLS1(config-vlan)#11
^
% Invalid input detected at '^' marker.
DLS1(config-vlan)#vlan 11
DLS1(config-vlan)#name MULTIMEDIA
DLS1(config-vlan)#vlan 434
DLS1(config-vlan)#name PROVEDORES
DLS1(config-vlan)#vlan 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#vlan 1010
^
% Invalid input detected at '^' marker.
DLS1(config-vlan)#10
^
% Invalid input detected at '^' marker.
DLS1(config-vlan)#vlan10
```

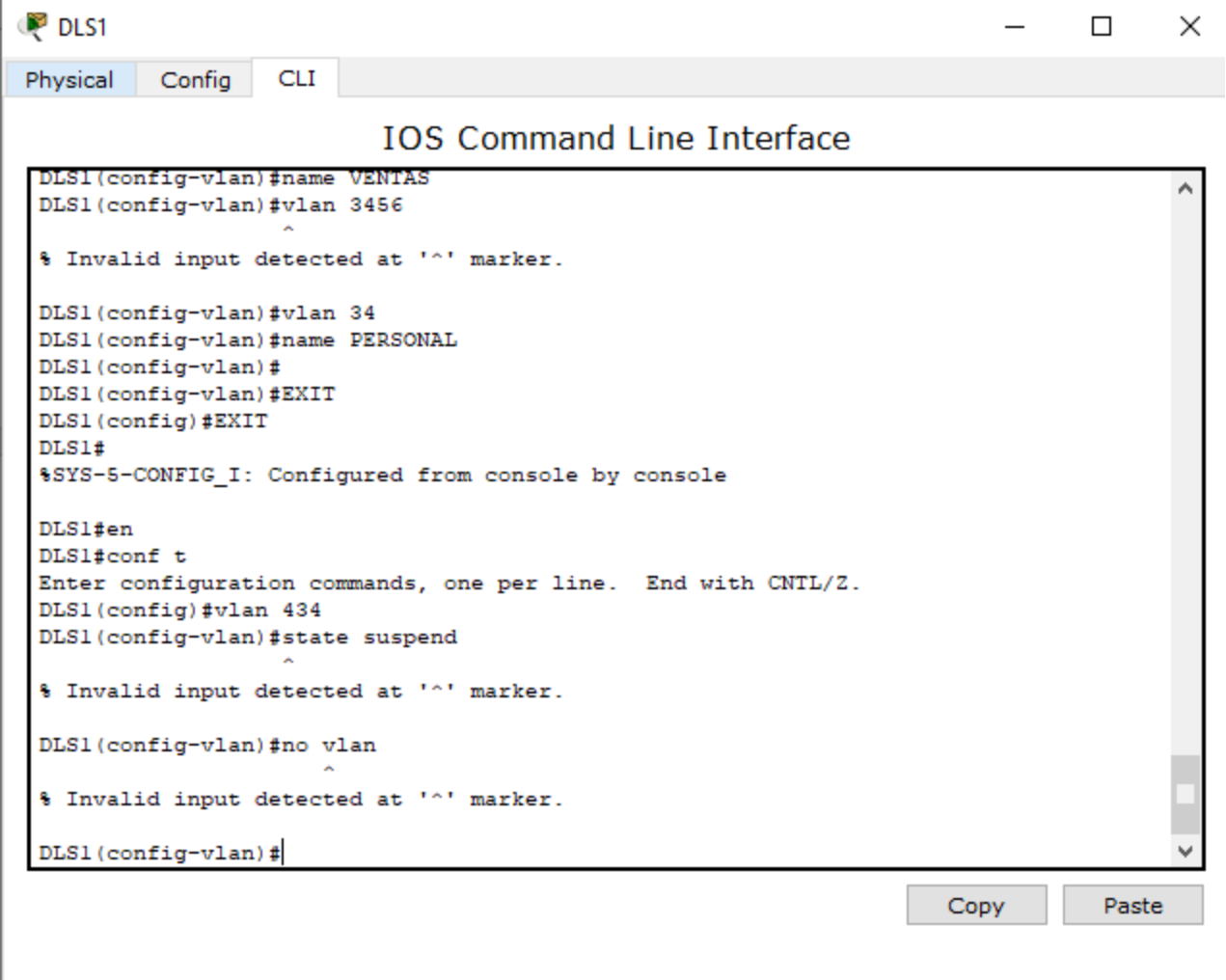
At the bottom right of the terminal window, there are "Copy" and "Paste" buttons.

Figura 44. Aplicando código DLS1 VLAN



- a. En DLS1, suspender la VLAN 434.

Figura 43. Aplicando código DLS1 434



The screenshot shows a terminal window titled "DLS1" with tabs for "Physical", "Config", and "CLI". The main content is the "IOS Command Line Interface" with the following text:

```
DLS1(config-vlan)#name VENTAS
DLS1(config-vlan)#vlan 3456
^
% Invalid input detected at '^' marker.

DLS1(config-vlan)#vlan 34
DLS1(config-vlan)#name PERSONAL
DLS1(config-vlan)#
DLS1(config-vlan)#EXIT
DLS1(config)#EXIT
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#en
DLS1#conf 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)#no vlan
^
% Invalid input detected at '^' marker.

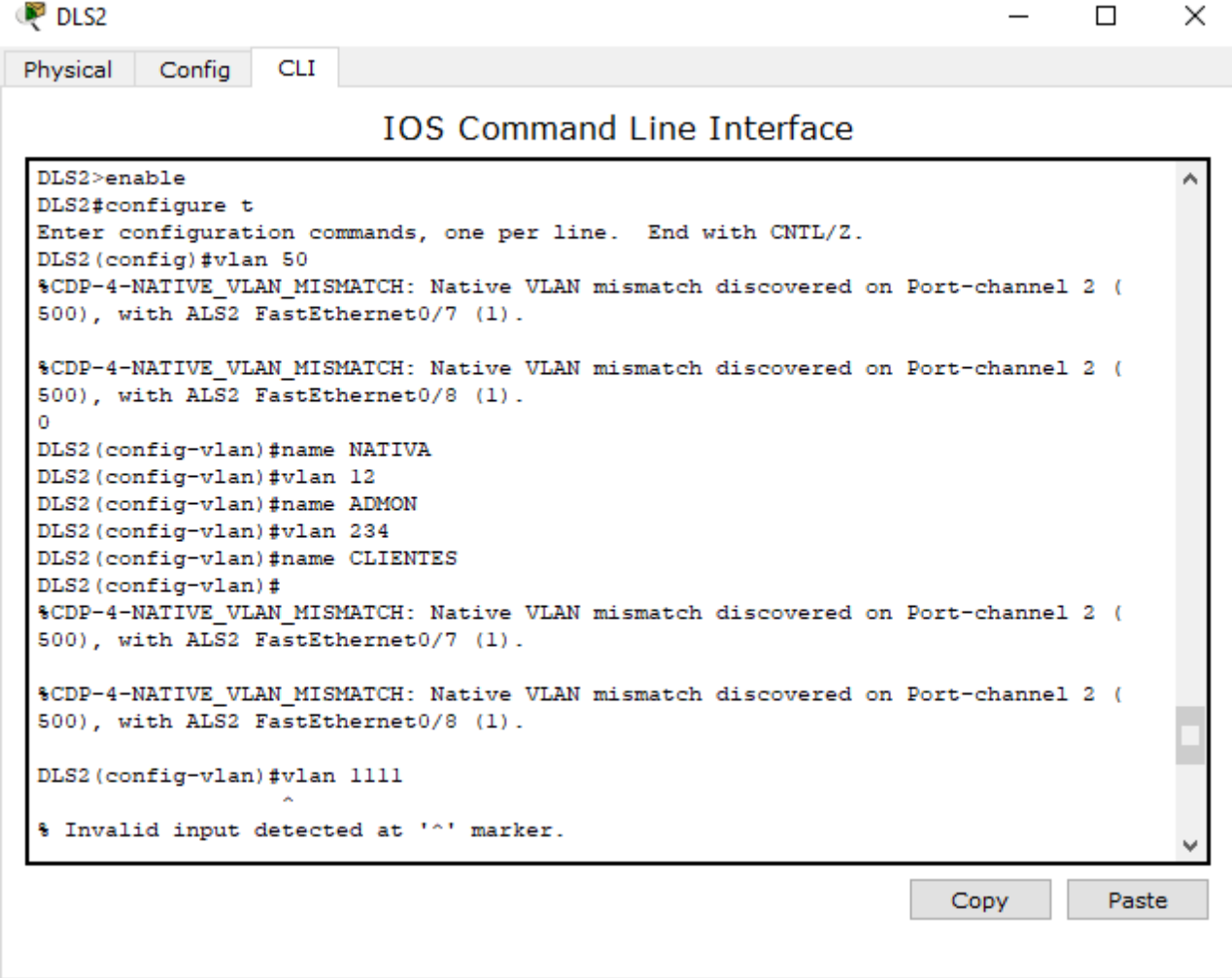
DLS1(config-vlan)#|
```

At the bottom right of the terminal window, there are "Copy" and "Paste" buttons.

Packet tracer no soporta el comando para suspender la Vlan.

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

Figura 44. Aplicando código DLS2 VTP transparente



The screenshot shows a network device CLI window titled "DLS2" with tabs for "Physical", "Config", and "CLI". The main window is titled "IOS Command Line Interface". The terminal output shows the following commands and messages:

```
DLS2>enable
DLS2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#vlan 50
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

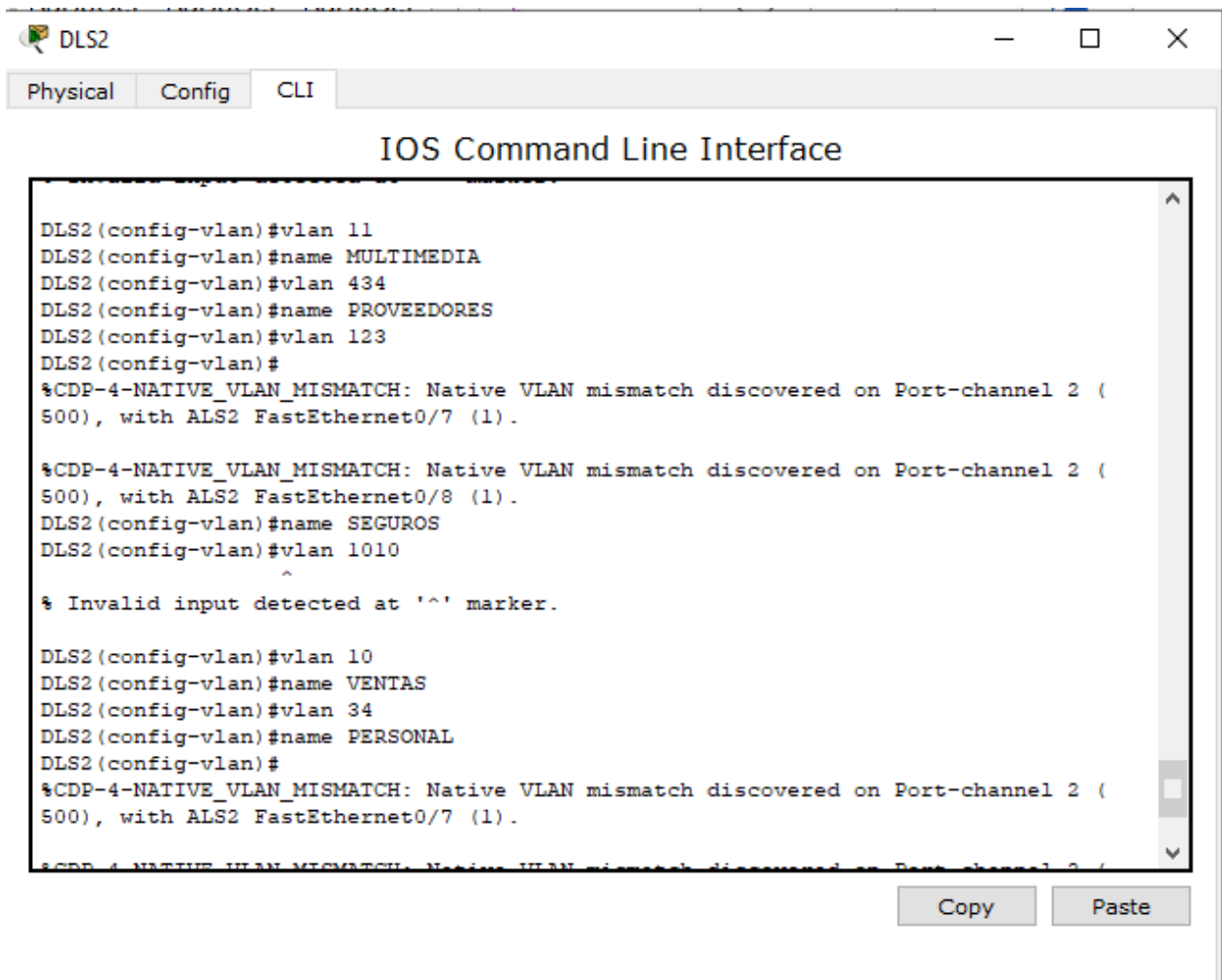
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).
0
DLS2(config-vlan)#name NATIVA
DLS2(config-vlan)#vlan 12
DLS2(config-vlan)#name ADMON
DLS2(config-vlan)#vlan 234
DLS2(config-vlan)#name CLIENTES
DLS2(config-vlan)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).

DLS2(config-vlan)#vlan 1111
^
% Invalid input detected at '^' marker.
```

At the bottom right of the terminal window, there are "Copy" and "Paste" buttons.

Figura 45. Aplicando código DLS2 VTP transparente



The screenshot shows a window titled "DLS2" with tabs for "Physical", "Config", and "CLI". The main area is titled "IOS Command Line Interface" and contains the following text:

```
DLS2(config-vlan)#vlan 11
DLS2(config-vlan)#name MULTIMEDIA
DLS2(config-vlan)#vlan 434
DLS2(config-vlan)#name PROVEEDORES
DLS2(config-vlan)#vlan 123
DLS2(config-vlan)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).
DLS2(config-vlan)#name SEGUROS
DLS2(config-vlan)#vlan 1010
      ^
% Invalid input detected at '^' marker.

DLS2(config-vlan)#vlan 10
DLS2(config-vlan)#name VENTAS
DLS2(config-vlan)#vlan 34
DLS2(config-vlan)#name PERSONAL
DLS2(config-vlan)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
```

At the bottom right of the CLI window, there are "Copy" and "Paste" buttons.

c. Suspende VLAN 434 en DLS2.

Figura 46. Aplicando código DLS2 suspender VLAN 434

```
DLS2(config-vlan)#EXIT
DLS2(config)#eexit
^
% Invalid input detected at '^' marker.

DLS2(config)#
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

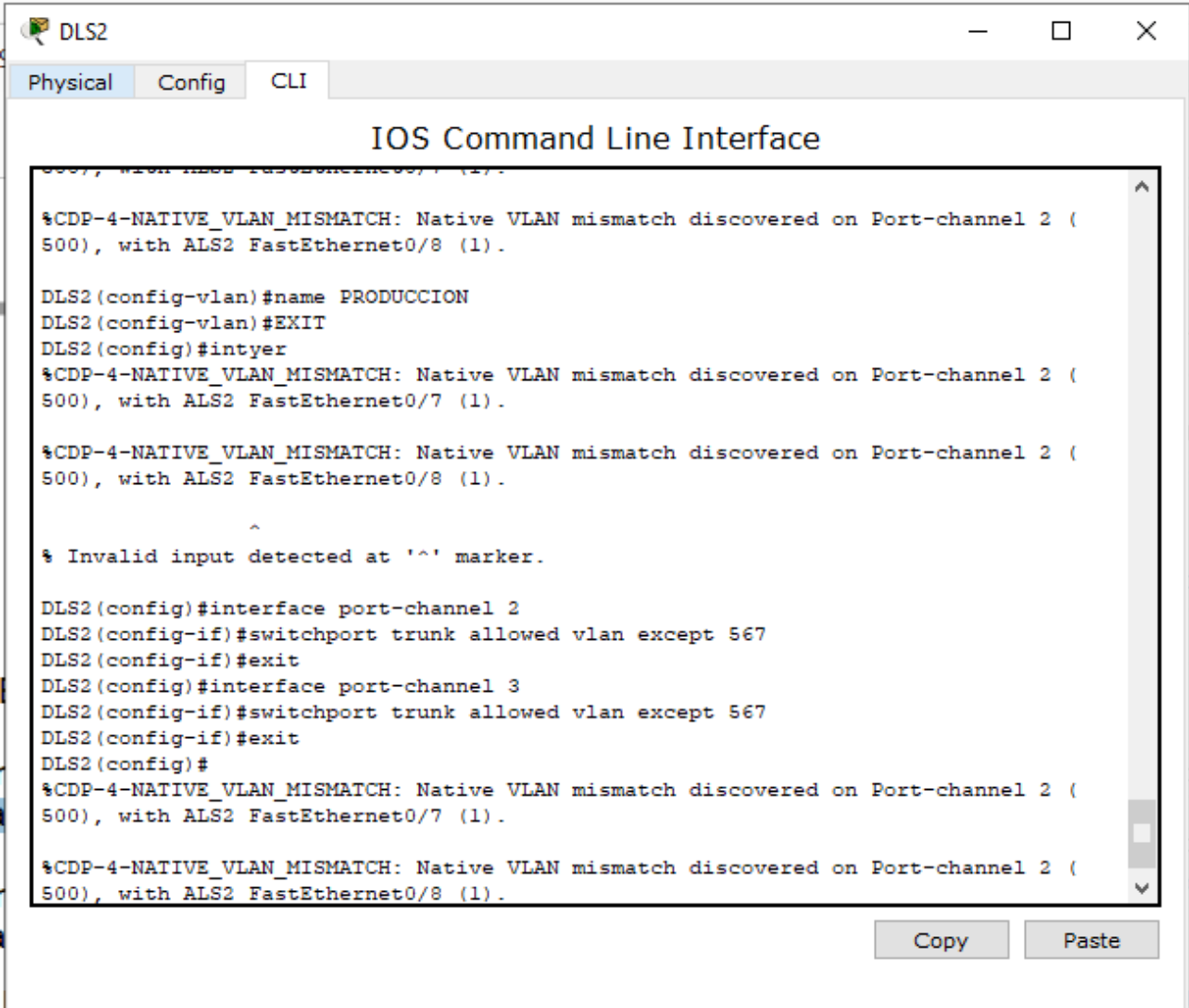
DLS2#enable
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).
vlan 434
DLS2(config-vlan)#state suspend
^
% Invalid input detected at '^' marker.

DLS2(config-vlan)#
```

- d. 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.

Figura 47. Aplicando código DLS2 VLAN 567



```
DLS2
Physical Config CLI
IOS Command Line Interface

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).

DLS2(config-vlan)#name PRODUCCION
DLS2(config-vlan)#EXIT
DLS2(config)#intyer
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).

^
% Invalid input detected at '^' marker.

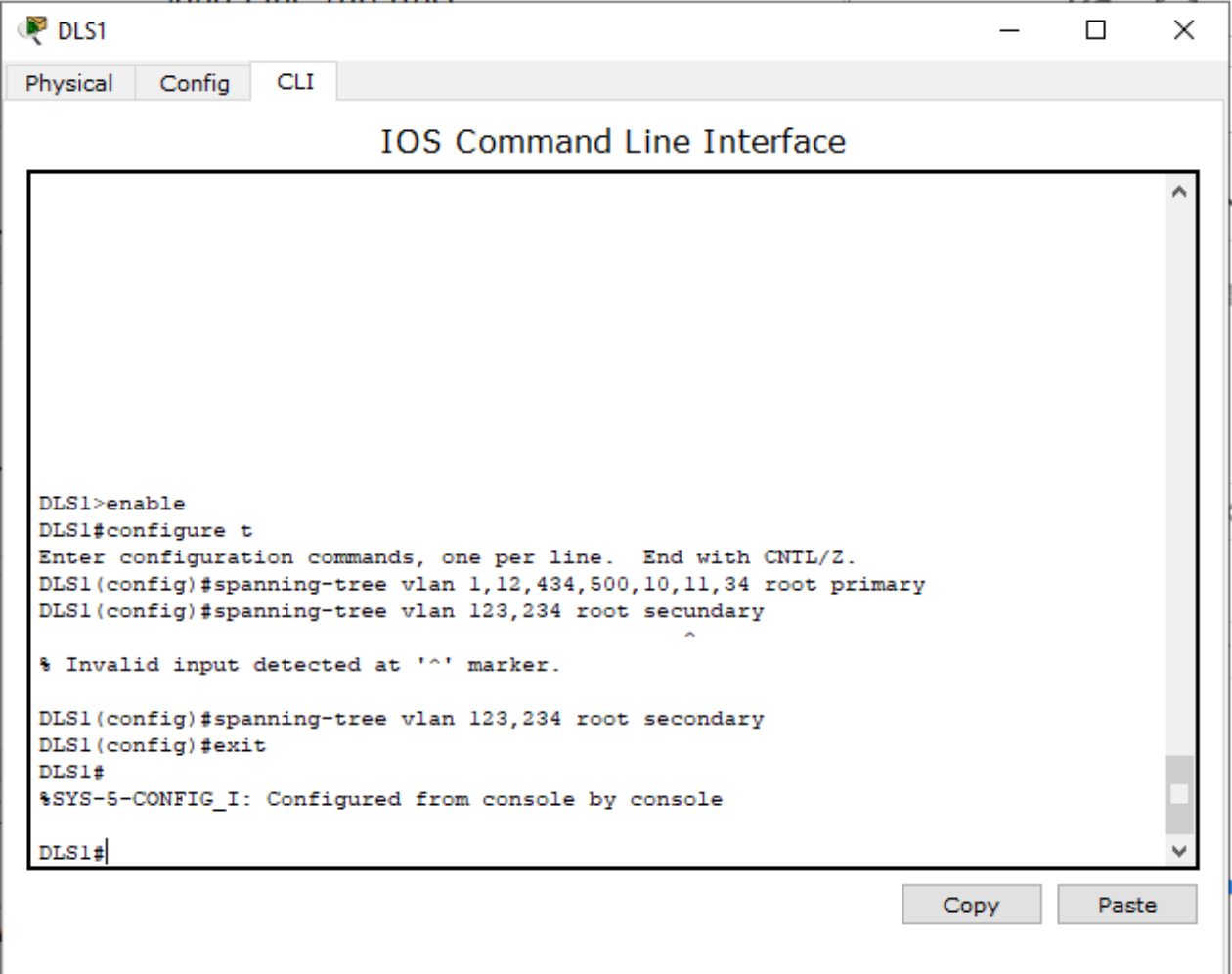
DLS2(config)#interface port-channel 2
DLS2(config-if)#switchport trunk allowed vlan except 567
DLS2(config-if)#exit
DLS2(config)#interface port-channel 3
DLS2(config-if)#switchport trunk allowed vlan except 567
DLS2(config-if)#exit
DLS2(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).

Copy Paste
```

- e. 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.

Figura 48. Aplicando código DLS1 Spanning tree root

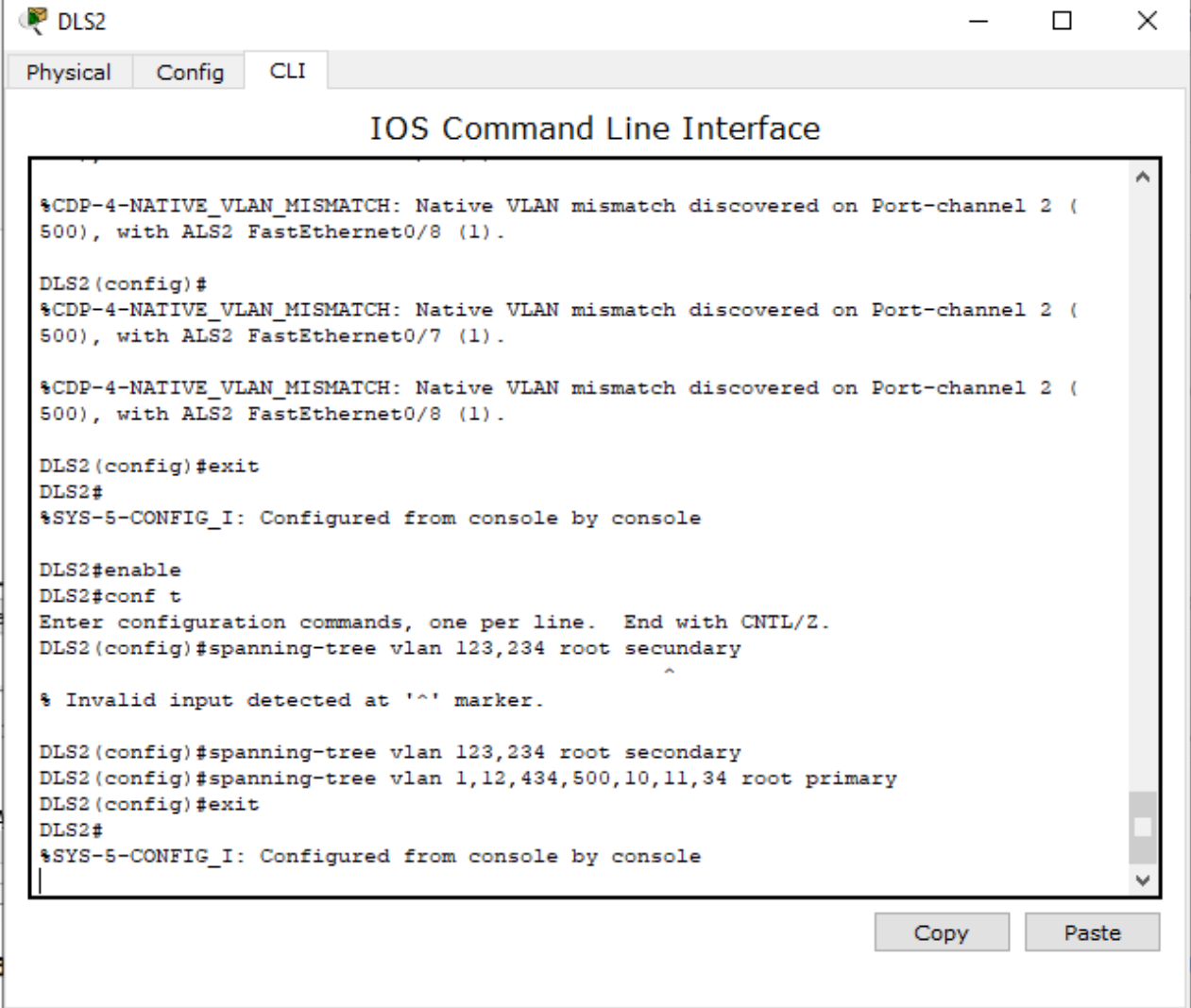


```
DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#spanning-tree vlan 1,12,434,500,10,11,34 root primary
DLS1(config)#spanning-tree vlan 123,234 root secondary
^
% Invalid input detected at '^' marker.

DLS1(config)#spanning-tree vlan 123,234 root secondary
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
DLS1#
```

- f. 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.

Figura 49. Aplicando código DLS2 Spanning tree root



```

DLS2
Physical Config CLI
IOS Command Line Interface

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).

DLS2(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with ALS2 FastEthernet0/8 (1).

DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

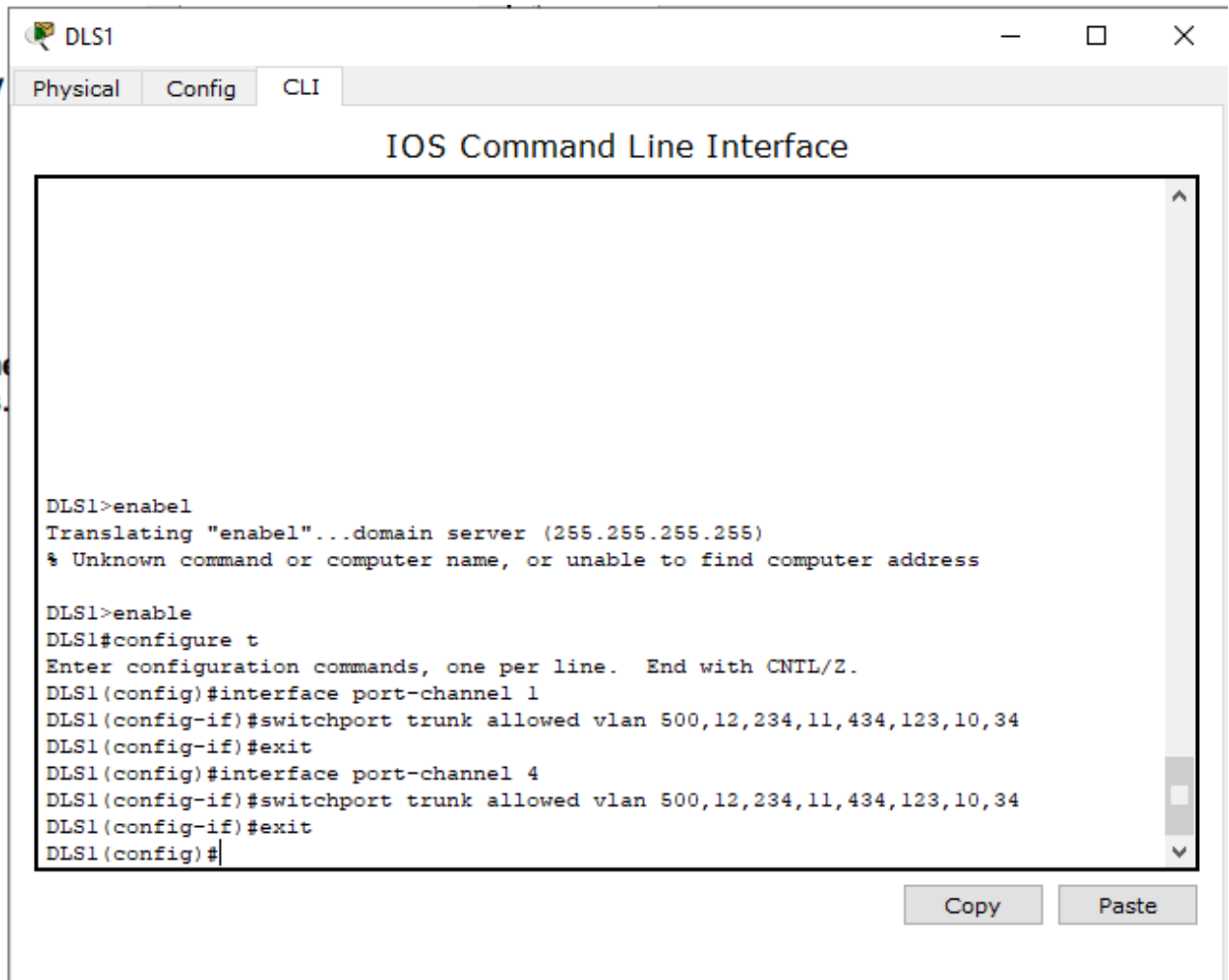
DLS2#enable
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#spanning-tree vlan 123,234 root secondary
^
% Invalid input detected at '^' marker.

DLS2(config)#spanning-tree vlan 123,234 root secondary
DLS2(config)#spanning-tree vlan 1,12,434,500,10,11,34 root primary
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

```

- g. 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.

Figura 50. Aplicando código DLS1 puertos como troncales



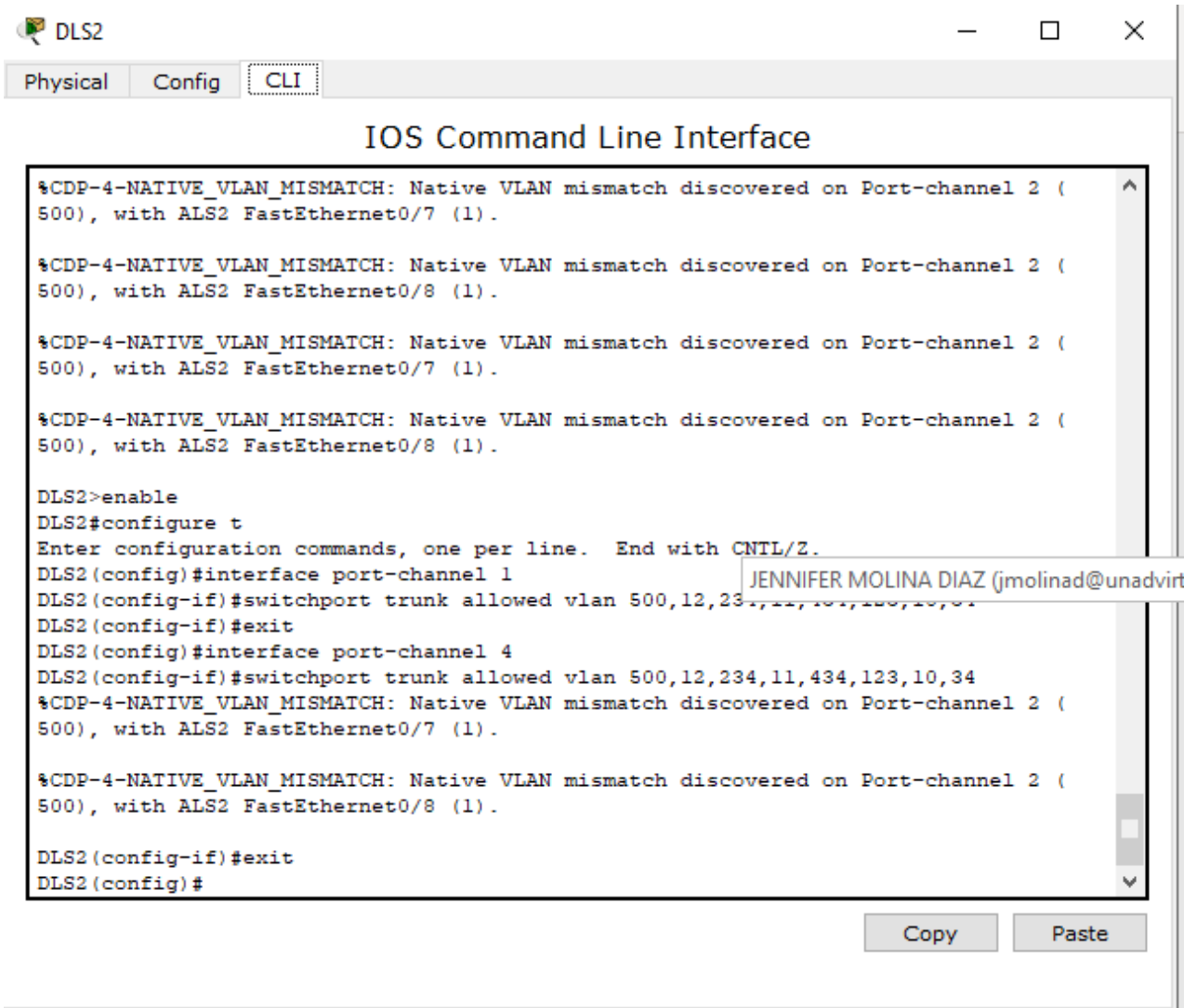
The image shows a screenshot of a network device's CLI interface. The window title is "DLS1" and it has tabs for "Physical", "Config", and "CLI". The main area is titled "IOS Command Line Interface" and contains the following text:

```
DLS1>enable
Translating "enable"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer address

DLS1>enable
DLS1#configure t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#interface port-channel 1
DLS1(config-if)#switchport trunk allowed vlan 500,12,234,11,434,123,10,34
DLS1(config-if)#exit
DLS1(config)#interface port-channel 4
DLS1(config-if)#switchport trunk allowed vlan 500,12,234,11,434,123,10,34
DLS1(config-if)#exit
DLS1(config)#
```

At the bottom right of the window, there are "Copy" and "Paste" buttons.

Figura 51. Aplicando código DLS2 puertos como troncales



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			

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

TABLA 6. Asignación de interfaces vlan

Figura 52. Aplicando código DLS1 interfaces

```
DLS1>enable
DLS1#configure t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface f0/6
DLS1(config-if)#switchport mode access
^
% Invalid input detected at '^' marker.

DLS1(config-if)#switchport mode access
DLS1(config-if)#switchport access vlan 345
% Access VLAN does not exist. Creating vlan 345
DLS1(config-if)#switchport access vlan 3456
^
% Invalid input detected at '^' marker.

DLS1(config-if)#switchport access vlan 345
DLS1(config-if)#no sh

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 f0/15
DLS1(config-if)#switchport mode access
DLS1(config-if)#switchport access vlan 111
% Access VLAN does not exist. Creating vlan 111
DLS1(config-if)#switchport access vlan 111
DLS1(config-if)#no sh

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

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Figura 53. Aplicando código DLS2 interfaces

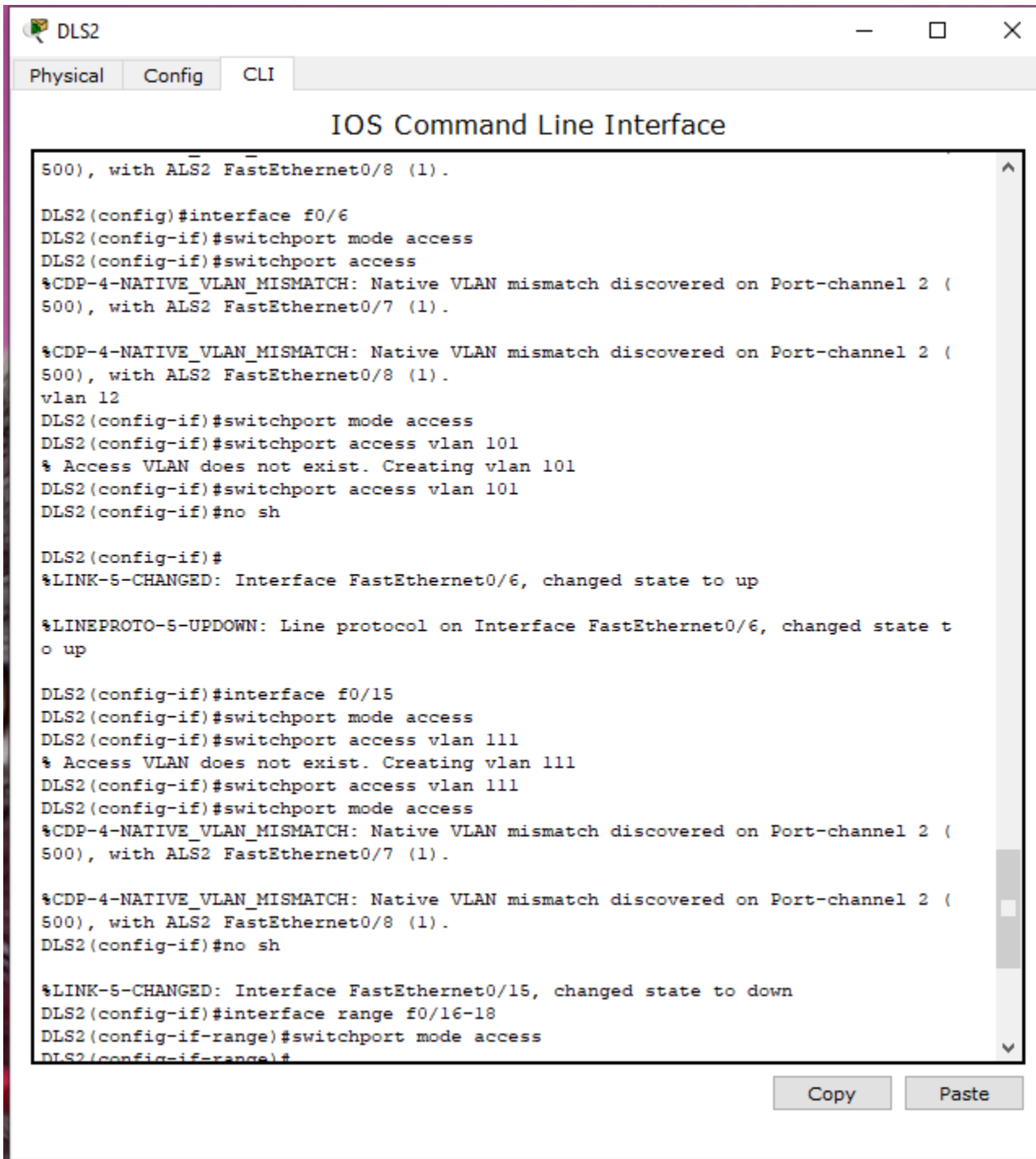


Figura 54. Aplicando código ASL1 interfaces

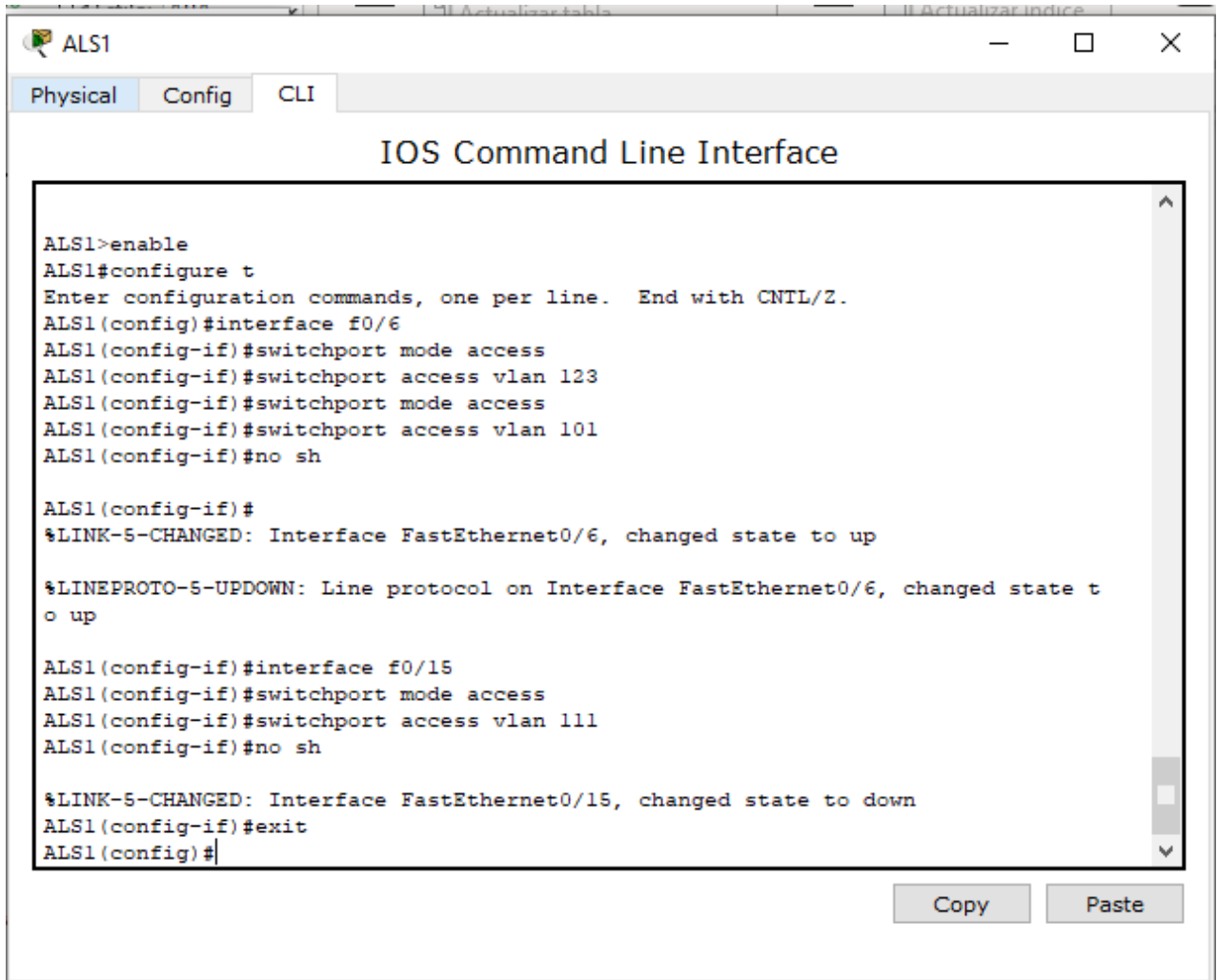


Figura 55. Aplicando código ASL2 interfaces

The screenshot shows a terminal window titled "ALS2" with tabs for "Physical", "Config", and "CLI". The main content is the "IOS Command Line Interface" showing a series of commands and system messages. The messages include warnings about native VLAN mismatches on port-channels and link status changes for interfaces f0/6 and f0/15. The configuration commands include enabling the device, entering configuration mode, setting interface f0/6 to access mode with VLAN 234, and setting interface f0/15 to access mode with VLAN 111. The session ends with the 'exit' command.

```
500), with DLS2 FastEthernet0/8 (1).

ALS2>enable
ALS2#configure t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with DLS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with DLS2 FastEthernet0/8 (1).

ALS2(config)#interface f0/6
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 234
ALS2(config-if)#no sh
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with DLS2 FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Port-channel 2 (
500), with DLS2 FastEthernet0/8 (1).

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to down
ALS2(config-if)#interface f0/15
ALS2(config-if)#switchport mode access
ALS2(config-if)#switchport access vlan 111
ALS2(config-if)#no sh

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

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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

Figura 56. Aplicando código DLS1 existencia de las VLAN

DLS1

Physical Config CLI

IOS Command Line Interface

```
DLS1#show vlan
```

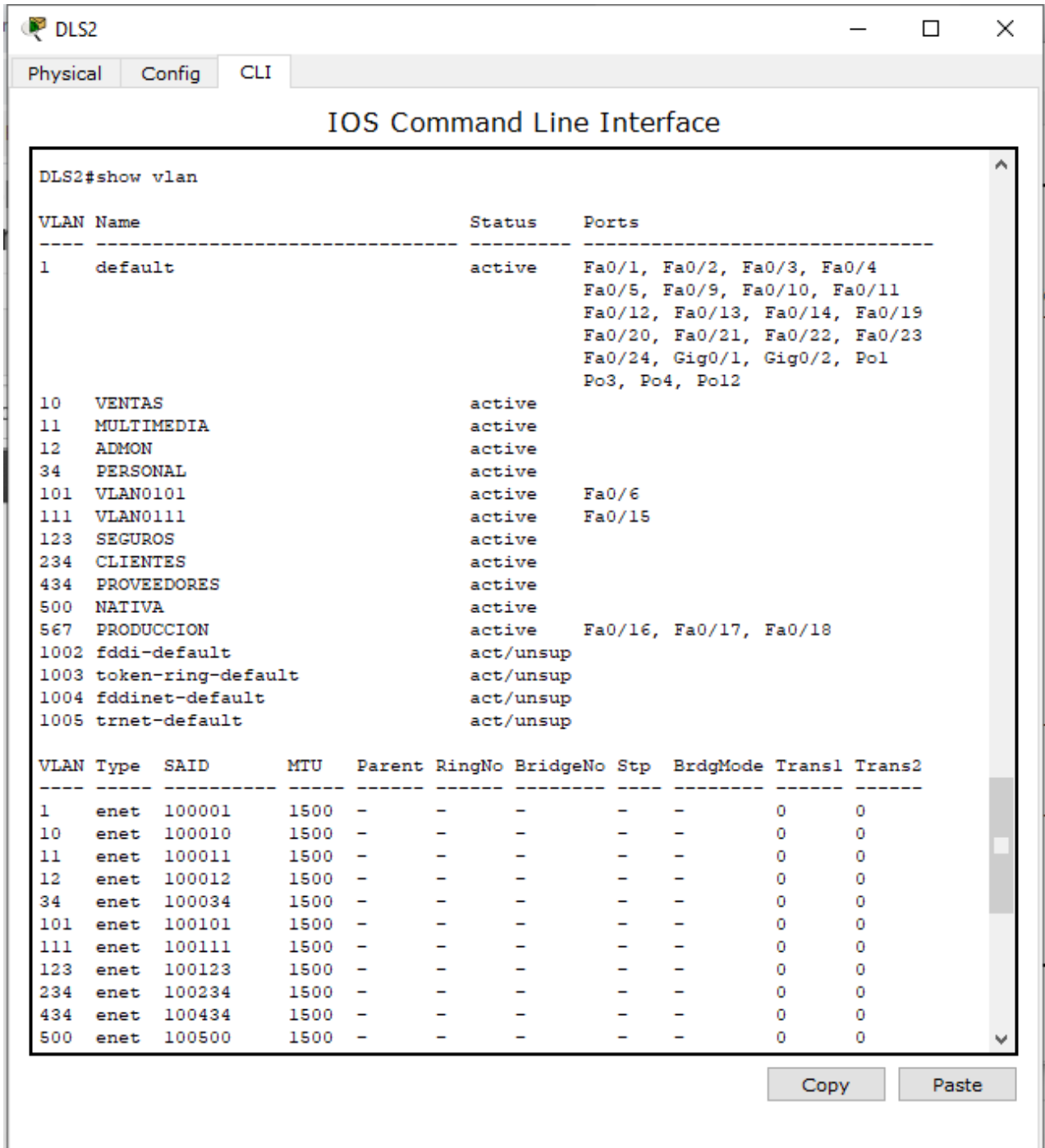
VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/11, Fa0/12, Fa0/13 Fa0/14, Fa0/16, Fa0/17, Fa0/18 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2 Pol, Po2, Po4, Pol2
10 VENTAS	active	
11 MULTIMEDIA	active	
12 ADMON	active	
34 PERSONAL	active	
111 VLAN0111	active	Fa0/15
123 SEGUROS	active	
234 CLIENTES	active	
345 VLAN0345	active	Fa0/6
434 PROVEEDORES	active	
500 NATIVA	active	
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
10	enet	100010	1500	-	-	-	-	-	0	0
11	enet	100011	1500	-	-	-	-	-	0	0
12	enet	100012	1500	-	-	-	-	-	0	0
34	enet	100034	1500	-	-	-	-	-	0	0
111	enet	100111	1500	-	-	-	-	-	0	0
123	enet	100123	1500	-	-	-	-	-	0	0

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Se verifica las vlan del código DSL1 se ejecuta el comando show vlan en cada swicht
 DLS1# show vlan se ejecuta el comando show vlan para validar las vlan configuradas

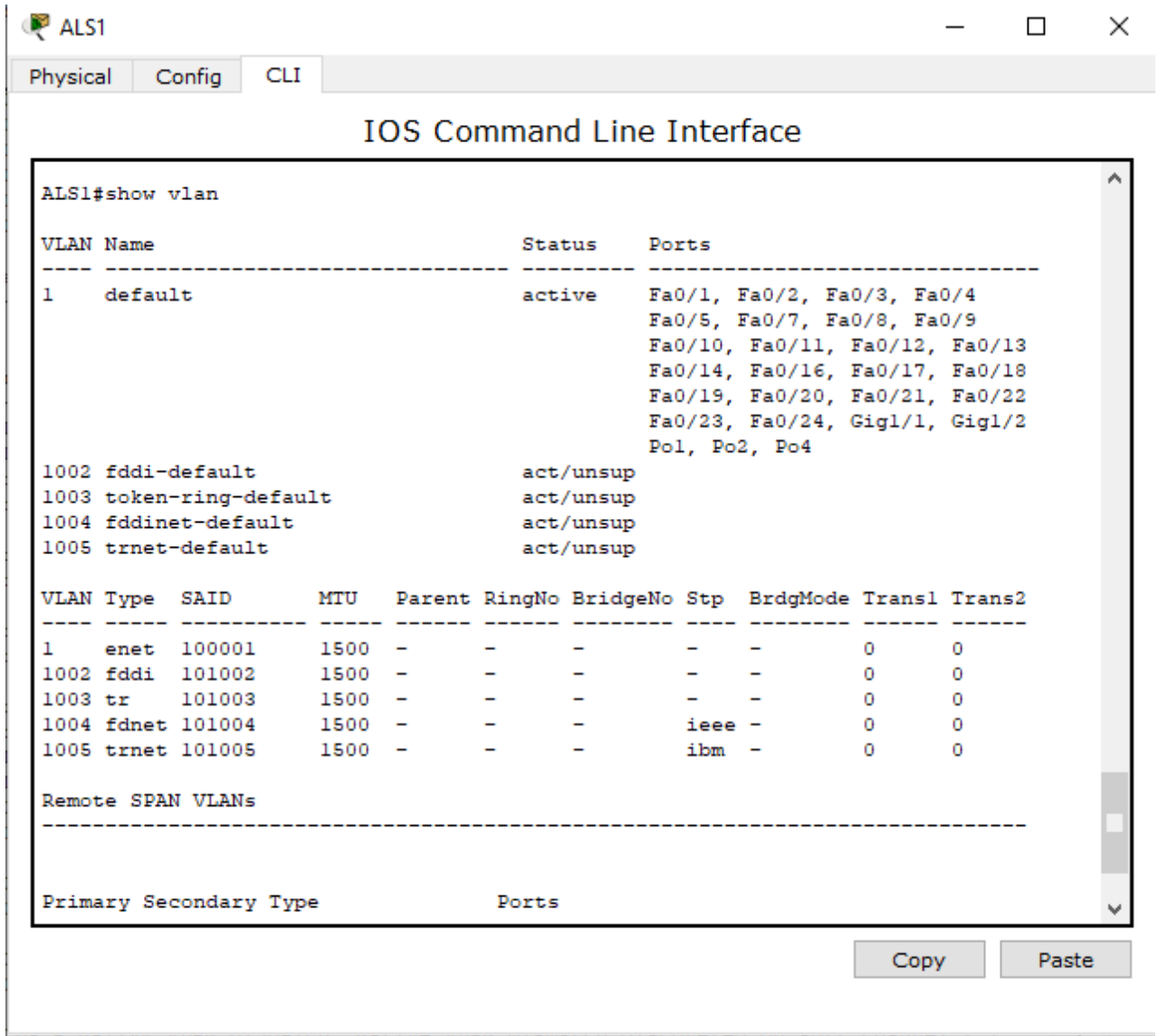
Figura 57. Aplicando código DLS2 existencia de las VLAN



Se verifica las vlan del código DSL2 se ejecuta el comando show vlan en cada swicht

DLS2# show vlan

Figura 58. Aplicando código ASL1 existencia de las VLAN



Se verifica las vlan del código ASL1 se ejecuta el comando show vlan en cada swicht

ALSl# show vlan

Figura 59. Aplicando código DLS2 existencia de las VLAN

ALS2#show vlan

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/9, Fa0/10, 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 Gig1/1, Gig1/2, Po3
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	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

Remote SPAN VLANs

Primary	Secondary	Type	Ports

ALS2#show interfaces trunk

Port	Mode	Encapsulation	Status	Native vlan
Po2	on	802.1q	trunking	500

Se verifica las vlan del código ASL2 se ejecuta el comando show vlan en cada swicht

ALS2# show vlan

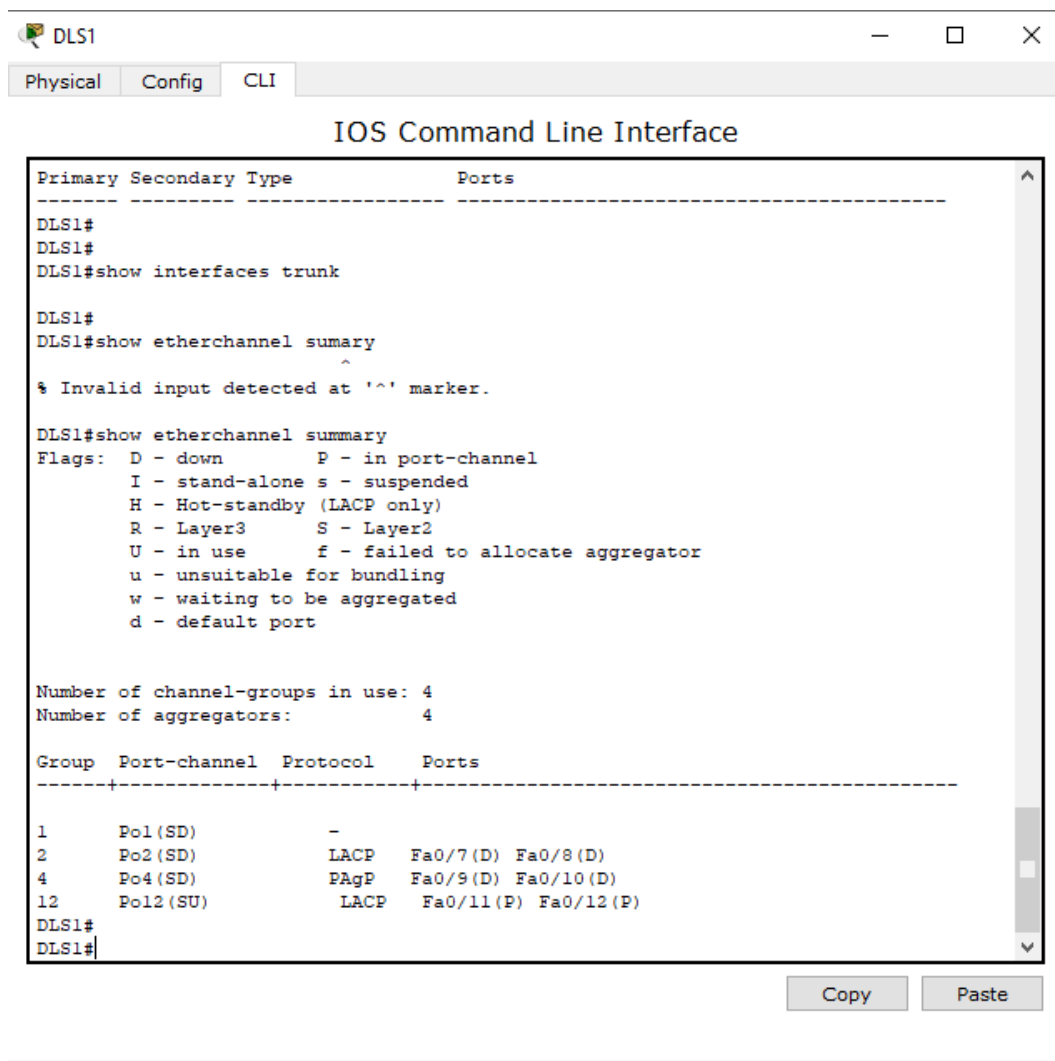
Este commando no indica las vlans configuradas en cada switch del escenario 2

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

Se ejecuta comando show ethertchannel sumary en cada swicht para validar su configuracion correcta

DLS1# show ethertchannel summary

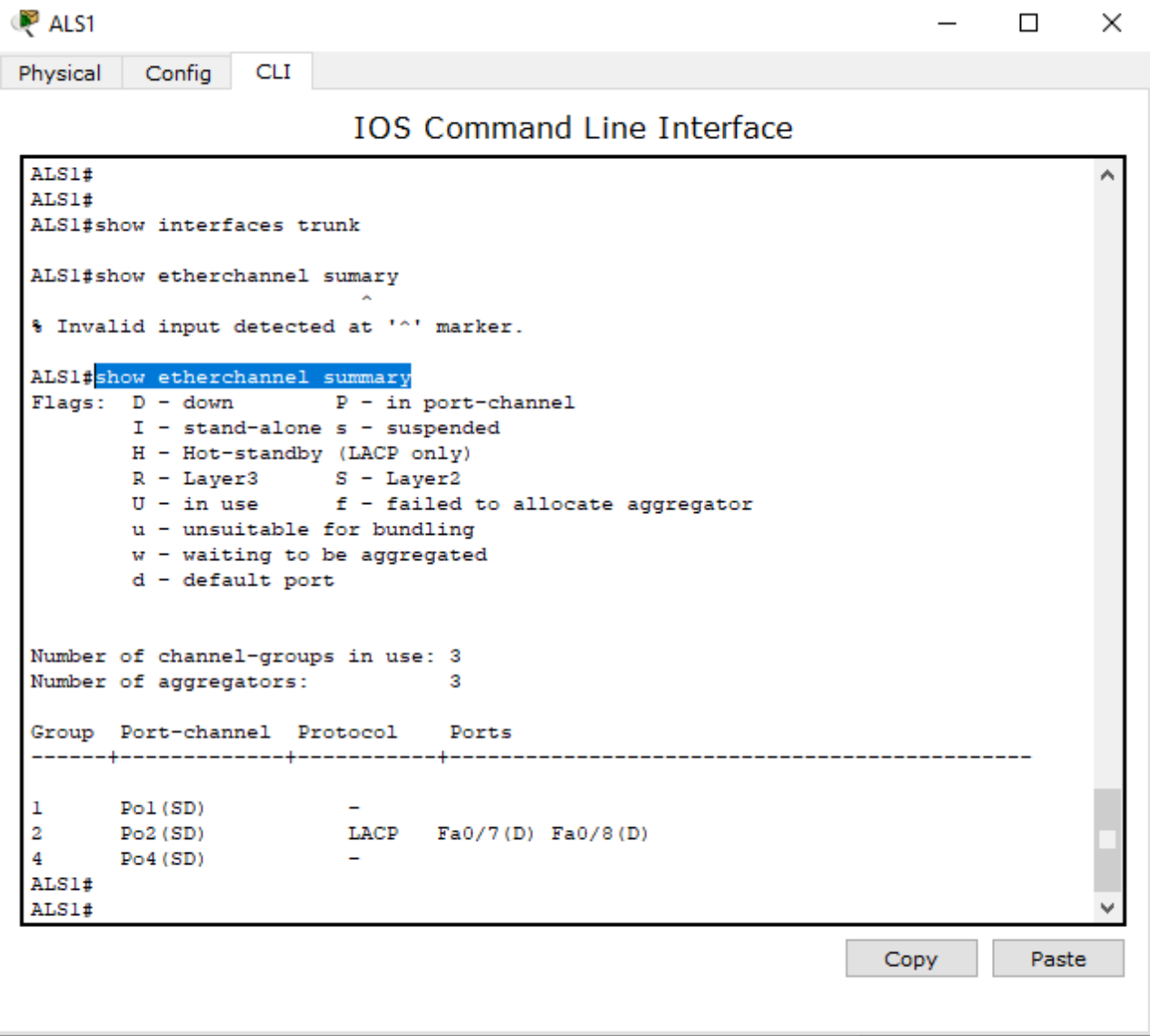
Figura 60. Aplicando código DLS1 EtherChannel



Se ejecuta comando show ethertchannel sumary en cada swicht para validar su configuracion correcta

ASL1# show ethertchannel summary

Figura 61. Aplicando código ASL1 EtherChannel



```
ALS1#
ALS1#
ALS1#show interfaces trunk

ALS1#show etherchannel summary
^
% Invalid input detected at '^' marker.

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: 3
Number of aggregators:          3

Group  Port-channel  Protocol    Ports
-----+-----+-----+-----
1      Po1(SD)          -           -
2      Po2(SD)          LACP       Fa0/7(D) Fa0/8(D)
4      Po4(SD)          -           -
ALS1#
ALS1#
```

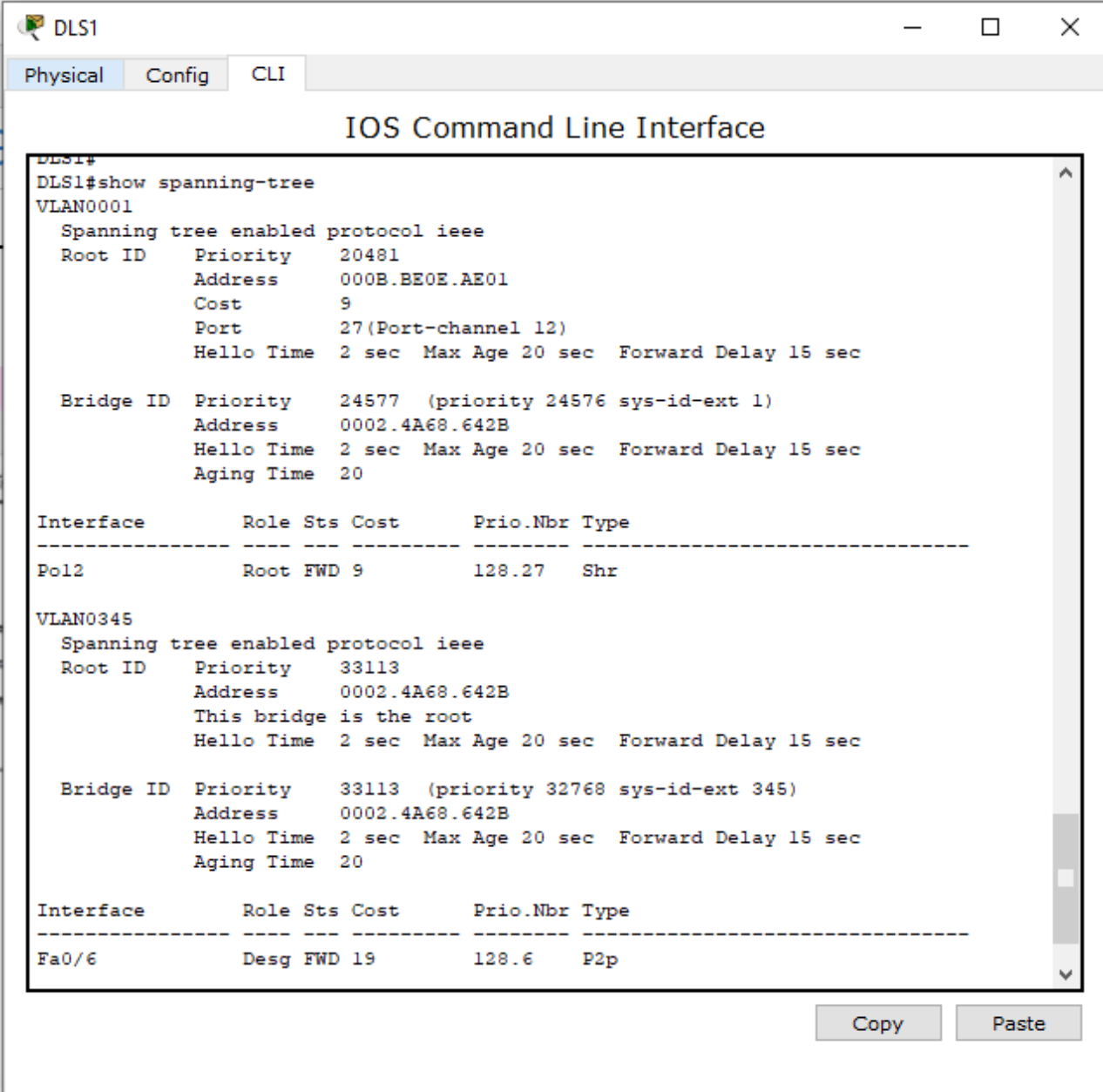
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c. Verificar la configuración de Spanning tree entre DLS1 o DLS2 para cada VLAN.

Se ejecuta comando show Spanning tree en cada swicht solicitado para validar su configuracion correcta

ASL1# show Spanning-tree

Figura 62. Aplicando código DLS1 Spanning tree



The screenshot shows a terminal window titled 'DLS1' with tabs for 'Physical', 'Config', and 'CLI'. The main content is the 'IOS Command Line Interface' displaying the output of the 'show spanning-tree' command. The output is organized into sections for VLAN0001 and VLAN0345, each showing root and bridge information and a table of interface roles.

```
DLS1#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    20481
            Address     000B.BE0E.AE01
            Cost       9
            Port       27 (Port-channel 12)
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    24577 (priority 24576 sys-id-ext 1)
            Address     0002.4A68.642B
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time  20

Interface          Role Sts Cost      Prio.Nbr Type
-----
Pol2                Root FWD 9         128.27  Shr

VLAN0345
  Spanning tree enabled protocol ieee
  Root ID    Priority    33113
            Address     0002.4A68.642B
            This bridge is the root
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    33113 (priority 32768 sys-id-ext 345)
            Address     0002.4A68.642B
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time  20

Interface          Role Sts Cost      Prio.Nbr Type
-----
Fa0/6              Desg FWD 19        128.6   P2p
```

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Figura 63. Aplicando código DLS2 Spanning tree

DLS2

Physical Config CLI

IOS Command Line Interface

```

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
Po2 Desg FWD 9 128.28 Shr

VLAN0011
Spanning tree enabled protocol ieee
Root ID Priority 24587
Address 000B.BE0E.AE01
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID Priority 24587 (priority 24576 sys-id-ext 11)
Address 000B.BE0E.AE01
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
Po2 Desg FWD 9 128.28 Shr

VLAN0012
Spanning tree enabled protocol ieee
Root ID Priority 24588
Address 000B.BE0E.AE01
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 000B.BE0E.AE01
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface Role Sts Cost Prio.Nbr Type
-----

```

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Se ejecuta comando show Spanning tree en cada swicht solicitado para validar su configuracion correcta

ASL1# show Spanning-tree

CONCLUSIONES

Por medio de este trabajo se permite comprender como se puede implementar y configurar una red que este soportada por Vlans con el uso de los protocolos VTP y STP, donde se pueda diseñar las plantillas de configuración para su uso en múltiples dispositivos, configurar troncales y vlans usando el protocolo VTP, los EtherChannel Link en red de switch interconectados, entro otros usos. El desarrollo de este trabajo permite reforzar los demás conocimientos adquiridos a través de la realización de los laboratorios durante el transcurso activo del curso y la solución de las lecciones evaluativas en el entorno de cisco (Netacad).

Para el escenario 1 Y 2 se aplicaron las configuraciones básicas y los protocolos de enrutamiento indicados, se crean interfaces loopback con asignación de direcciones, se implementan anchos de banda con tiempo de retardo de microsegundos, se verifican los resultados obtenidos por medio de los comandos show ip router.

Una red de grandes proporciones o también llamada WAN es muy propensa a redundancias entre conexiones de equipos también llamados bucles, lo que haría que la información rebote entre los equipos y nunca llegue a su destino, es por ello que el uso del protocolo STP Spanning Tree Protocol o Árbol de Expansión , protocolo que permite usar las conexiones e la difusión de mensajes a través de troncales por VLAN es una de las herramientas más efectivas para hacer llegar la información de manera segura.

El agilizar la respuesta entre redes y el tráfico en los equipos de la misma sobre una WAN es primordial para la eficacia de la red, por lo tanto protocolos como el OSPF y el EIGRP son necesarios para la identificación de cada router , así cada rotuer que comprende la red conocerá sus vecinos , las direcciones IP que tienen y la distancia de cada uno de estos , mejorando así la respuesta y comunicación entre los dispositivos de la red configurada.

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