

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

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD ESCUELA DE  
CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI  
INGENIERÍA ELECTRÓNICA  
BOGOTÁ D.C.  
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Diplomado de opción de grado presentado para optar el  
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INGENIERÍA ELECTRONICA  
BOGOTA  
2020

NOTA DE ACEPTACIÓN

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Firma del Presidente del Jurado

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Firma del Jurado

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Firma del Jurado

BOGOTA D.C., 22 de mayo de 2020

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Este trabajo es para agradecer a cada una de las personas que me han apoyado fielmente y me han dado todo su apoyo y energía para poder lograr cada una de mis metas y fuerzas personales, para así poder lograr cumplir todas mis metas y fuerzas que logren a cabalidad lograr mis expectativas, gracias a mi familia a mis amigos que sin su apoyo y fuerza de voluntad no hubiese podido salir adelante. Especialmente a mi mama persona muy importante en mi vida que me ha dado todo lo que tengo, a mi mejor amiga Lizeth Suarez aquella mujer que ha estado pendiente atenta y me ha apoyado en los momentos más difíciles de mi vida y que sin su templanza compañía ni auxilio nada hubiese sido posible.

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## GLOSARIO

**OSPF:** Open Shortest Path First (OSPF) es un protocolo de direccionamiento de tipo enlace-estado, desarrollado para las redes IP y basado en el algoritmo de primera vía más corta (SPF). OSPF es un protocolo de pasarela interior (IGP). En una red OSPF, los direccionadores o sistemas de la misma área mantienen una base de datos de enlace-estado idéntica que describe la topología del área. Cada direccionador o sistema del área genera su propia base de datos de enlace-estado a partir de los anuncios de enlace-estado (LSA)

**SWITCHING:** El switching se utiliza para conectar varios dispositivos a través de la misma red dentro de una misma oficina o edificio. Se utiliza el switching cuando queremos transportar datos de un sitio a otro con la capacidad de tener menos colisiones posibles dentro de la misma red. Esto es lo que hace que aumente la efectividad de transferencia de datos.

**Spanning Tree Protocol:** Spanning Tree Protocol (STP) es un protocolo de capa 2 que se ejecuta en bridges y switches. La especificación para STP es IEEE 802.1D. El propósito principal de STP es garantizar que no cree loops cuando tenga trayectorias redundantes en su red, estos loops generan que los datos sean redundantes y se envuelvan sobre si mismos generando una gran lentitud en los datos.

**Vlan:** Una Virtual Local Area Network (VLAN) o red de área local virtual es un grupo flexible de dispositivos que se encuentran en cualquier ubicación de una red de área local pero que se comunican como si estuvieran en el mismo segmento físico. Con las VLANs se puede segmentar la red sin restringirse a las ubicaciones o conexiones físicas.

## RESUMEN

En el presente trabajo vamos a realizar una configuración predefinida en 2 escenarios que realizaron los procesos aprendidos en el transcurso del curso, buscando la aplicación correcta de los códigos y procesos relacionados para que la configuración sea correcta, esta configuración nos va a ayudar para poder comprender y analizar los diferentes procesos en cuestión.

A través de cisco por medio del curso CCNP buscamos una manera de aprender las mejores maneras de conmutar y enrutar diferentes Redes que aumenten la calidad, la electrónica es fundamental en este proceso ya que buscamos que tanto la conmutación y el enrutamiento sea de calidad y correcto.

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

## ABSTRACT

In the present work, we are going to make a predefined configuration in two scenarios that carried out the processes learned in the course, looking for the correct application of the codes and related processes so that the configuration is correct, this configuration will help us to understand and analyze the different processes in question

Using cisco through the CCNP course we look for a way to learn the best ways to switch and route different Networks that increase quality, electronics is fundamental in this process since we seek that both the switching and the routing are of quality and correct.

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

## INTRODUCCIÓN

En el desarrollo de las redes actuales y todo el organismo actual de los switch y Routers del proceso, y todo el organismo actual permite que todo se pueda mejorar y trabajar de manera fluida y organizada, que permite que todo fluya de manera orgánica y trabajada, se plantean 2 escenarios para poder efectuar correctamente toda la aplicación.

Vamos a efectuar correctamente las 2 simulaciones y programaciones para cumplir a cabalidad todos los retos planteados en el desarrollo de las actividades que nos permite actuar y generar un gran nivel de concentración y de versatilidad en el desarrollo de nuestras actividades generales. Uno en el cual buscamos un ambiente para generar 2 redes diferentes, y el otro para poder ver un efecto aplicado

Lo que buscamos es afianzar nuestros conocimientos para poderlos efectuar en el mundo laboral actual, buscando así fiabilidad, trazabilidad y control de datos a través de una network algo muy importante y vital para el desarrollo actual.

## DESARROLLO

### 1. ESCENARIO 1

Figura 1. Escenario 1

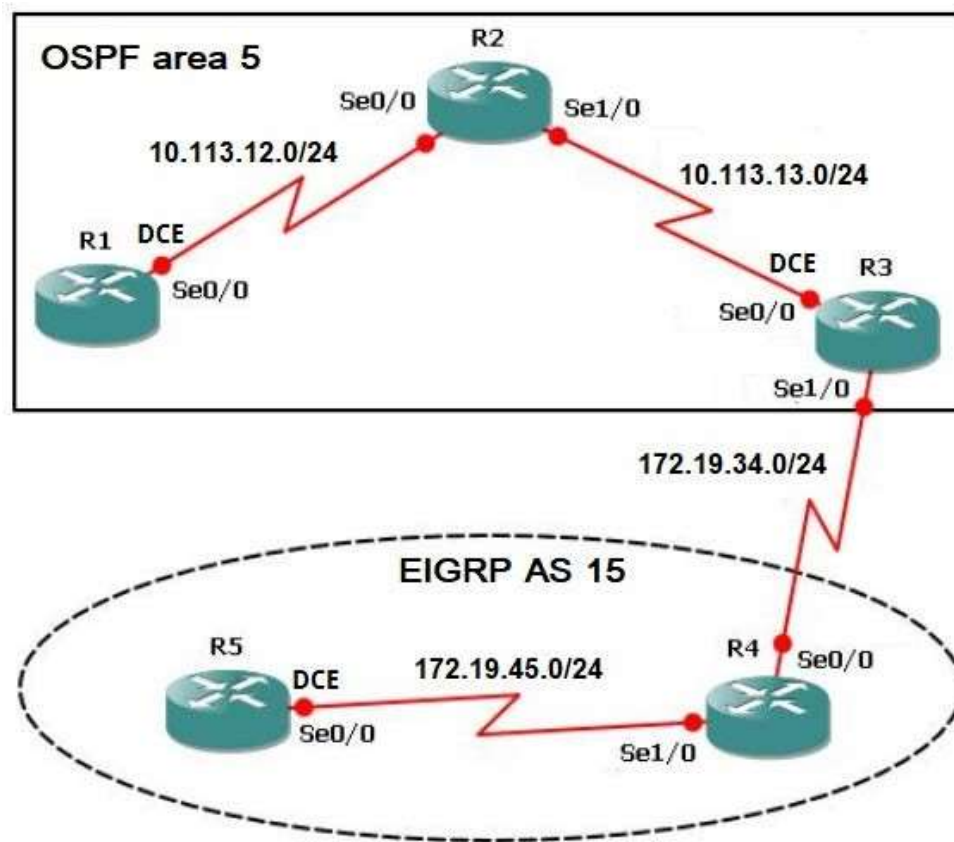
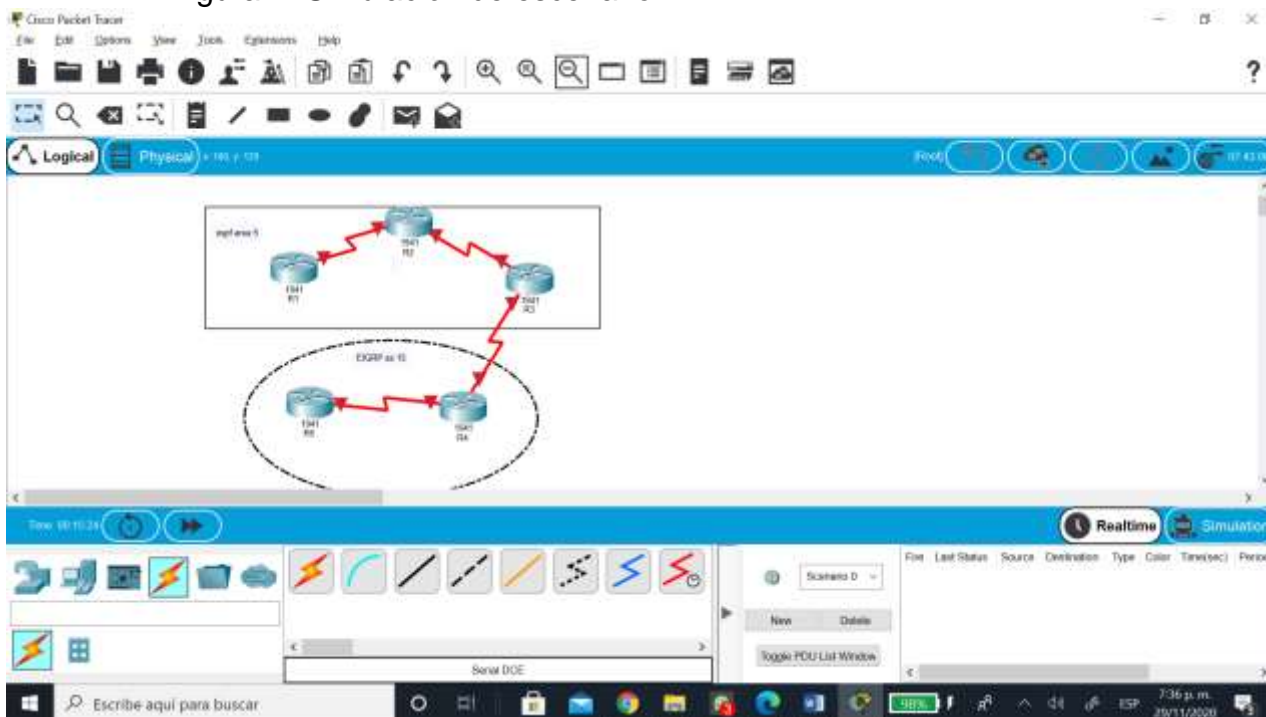


Figura 2. Simulación de escenario 1



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.

### Router R1

```

Router>
Router>enable
Router#configure terminal
Router(config)#hostname R1
R1
R1(config)#interface s0/0/0
R1(config-if)#bandwidth 128000
R1(config-if)#ip address 10.103.12.10 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.103.12.0 0.0.0.255 area 5
    
```

Ingreso a modo privilegiado  
 Ingreso a modo de configuración  
 Asigno nombre al router  
 Seleccionamos la interface serial  
 programamos el ancho de banda  
 configuramos la ip y la mascara  
 configuramos la ip y la mascara de la net

Figura 3. Aplicando código R1

```
R1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface s0/0/0
R1(config-if)#bandwidth 128000
R1(config-if)#ip address 10.103.12.10 255.255.255.0
R1(config-if)#
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.103.12.0 0.0.0.255 area 0
R1(config-router)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console
|
```

## Router R2

Router>

Router>enable

Ingreso a modo privilegiado

Router#configure terminal

Ingreso a modo de configuración

Router(config)#hostname R2

Asigno nombre al router

R2

R2(config)#interface s0/0/0

ingresamos a la interface serial 0

R2(config-if)#ip address 10.103.12.20 255.255.255.0

asignamos la ip y la mascara

R2(config-if)#no shutdown

abrimos el puerto

R2(config-if)#interface s0/0/1

ingresamos a la interface serial 1

R2(config-if)#ip address 10.103.23.20 255.255.255.0

asignamos la ip y la mascara

R2(config-if)#no shutdown

abrimos el puerto

R2(config-if)#exit

R2(config)#router ospf 1

R2(config-router)#network 10.103.12.0 0.0.0.255 area 5

asignamos ip y mascara de la net

R2(config-router)#

00:06:19: %OSPF-5-ADJCHG: Process 1, Nbr 10.103.12.10 on Serial0/0/0

Figura 4. Aplicando código R2



### Router R3

Router>	
Router>enable	Ingreso a modo privilegiado
Router#configure terminal	Ingreso a modo de configuración
Router(config)#hostname R3	Asigno nombre al router
R3	
R3(config)#interface s0/0/1	seleccionamos la interfaz serial 1
R3(config-if)#bandwidth 128000	aplicamos el ancho de banda
R3(config-if)#ip address 10.103.23.10 255.255.255.0	seleccionamos la ip y la mascara
R3(config-if)#no shutdown	mantenemos activo el puerto
R3(config-if)#int s0/0/0	seleccionamos la inferfaz serial 0
R3(config-if)#ip address 172.29.34.10 255.255.255.0	seleccionamos la ip y la mascara
R3(config-if)#no shutdown	mantenemos activo el puerto
R3(config-if)#exit	
R3(config)#router ospf 1	entramos al router a configurar
R3(config-router)#network 10.103.23.0 0.0.0.255 area 5	aplicamos la ip y mascara de la net
R3(config-router)#	
00:20:03: %OSPF-5-ADJCHG: Process 1, Nbr 10.103.23.20 on Serial0/0/1 from LOADING to FULL, Loading Done	
R3(config-router)#exit	
R3(config)#router eigrp 15	entramos al Segundo grupo de net
R3(config-router)#network 172.29.34.0 0.0.0.255	aplicamos la ip y la mascara de la net

Figura 5. Aplicando código R3

```
R3(config)#interface s0/0/1
R3(config-if)#bandwidth 128000
R3(config-if)#ip address 10.103.23.10 255.255.255.0
R3(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R3(config-if)#int s0/0/0
R3(config-if)#ip address 172.29.34.10 255.255.255.0
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)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

R3(config)#router ospf 1
R3(config-router)#network 10.103.23.0 0.0.0.255 area 0
R3(config-router)#
R3(config-router)#exit
R3(config)#router eigrp 10
R3(config-router)#network 172.29.34.0 0.0.0.255
R3(config-router)#exit
R3(config)#
```

#### Router R4

Router>

Router>enable

Ingreso a modo privilegiado

Router#configure terminal

Ingreso a modo de configuración

Router(config)#hostname R4

Asigno nombre al router

R4

R4(config)#interface s0/0/0

seleccionamos la interfaz 0

R4(config-if)#ip address 172.29.34.20 255.255.255.0 aplicamos la ip y la mascara

R4(config-if)#no shutdown

mantenemos la interfaz abierta

R4(config-if)#interface s0/0/1

seleccionamos la interfaz 1

R4(config-if)#ip address 172.29.45.20 255.255.255.0 aplicamos la ip y la mascara

R4(config-if)#no shutdown

mantenemos la inferfaz abierta

R4(config-if)#exit

R4(config)#router eigrp 15

seleciconamos el router

R4(config-router)#network 172.29.34.0 0.0.0.255 aplicamos la ip y mascara del router

R4(config-if)#

%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 172.29.34.10 (Serial0/0/0) is up:  
new adjacency



Figura 6. Aplicando código R4

```

R4(config)#
R4(config)#interface s0/0/0
R4(config-if)#ip address 172.29.34.20 255.255.255.0
R4(config-if)#no shutdown

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

R4(config-if)#interface s0/0/1
R4(config-if)#
R4(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ip address 172.29.45.20 255.255.255.0
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 172.29.34.0 0.0.0.255
R4(config-router)#
R4(config-router)#exit
R4(config)#network 172.29.45.0 0.0.0.255
*
% Invalid input detected at '^' marker.

R4(config)#router eigrp 10
R4(config-router)#network 172.29.45.0 0.0.0.255
R4(config-router)#exit
R4(config)#exit
R4#
%SYS-5-CONFIG_I: Configured from console by console

```

## Router R5

Router>

Router>enable

Ingreso a modo privilegiado

Router#configure terminal

Ingreso a modo de configuración

Router(config)#hostname R4

Asigno nombre al router

R5

R5(config)#interface s0/0/1

seleccionamos el interfaz 1

R5(config-if)#bandwidth 128000

programamos el ancho de banda

R5(config-if)#ip address 172.29.45.10 255.255.255.0

aplicamos la ip y la mascara

R5(config-if)#no shutdown

mantenemos la interfaz abierta

R5(config-if)#exit

R5(config)#router eigrp 15

configuramos el router eigrp

R5(config-router)#network 172.29.45.0 0.0.0.255

configuramos la ip y la mascara de la net

R5(config-router)#

%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 172.29.45.20 (Serial0/0/1) is up:  
new adjacency

Figura 7. Aplicando código R5

```

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R5
R5(config)#interface s0/0/1
R5(config-if)#bandwidth 128000
R5(config-if)#ip address 172.29.45.10 255.255.255.0
R5(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R5(config-if)#exit
R5(config)#exit
R5#
%SYS-5-CONFIG_I: Configured from console by console

R5#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
R5(config)#router eigrp 10
R5(config-router)#network 172.29.45.0 0.0.0.255
R5(config-router)#

```

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.

Inicialmente generamos una tabla con el listado de las subredes

Tabla 1. Interfaces loopback para crear R1

RED	RANGO DE REDES	BROADCAST
10.1.0.0/24	10.1.0.0-10.1.0.254	10.1.0.255
10.1.1.0/24	10.1.1.0-10.1.1.254	10.1.1.255
10.1.2.0/24	10.1.2.0-10.1.2.254	10.1.2.255
10.1.3.0/24	10.1.3.0-10.1.3.254	10.1.3.255

Programamos en R1.

```

R1(config)#interface loopback 0          configuramos el loopback 0
R1(config-if)#ip address 10.1.0.10 255.255.255.0 configuramos la ip y la dns
R1(config-if)#interface loopback 1      configuramos el loopback 1
R1(config-if)#ip address 10.1.1.10 255.255.255.0 configuramos la ip y la dns
R1(config-if)#interface loopback 2      configuramos el loopback 2
R1(config-if)#ip address 10.1.2.10 255.255.255.0 configuramos la ip y la dns
R1(config-if)#interface loopback 3      configuramos el loopback 3
R1(config-if)#ip address 10.1.3.10 255.255.255.0 configuramos la ip y la dns
R1(config-if)#exit
R1(config)#router ospf 1                 configuramos el router
R1(config-router)#network 10.1.0.0 0.0.0.255 area 5 configuramos la ip y la dns
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

```

Figura 8. Interfaces de Loopback en R1

```

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

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

R1(config-if)#ip address 10.1.1.10 255.255.255.0
R1(config-if)#interface loopback 2

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback2, changed state to up

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

R1(config-if)#ip address 10.1.2.10 255.255.255.0
R1(config-if)#interface loopback 3

R1(config-if)#
%LINK-5-CHANGED: Interface Loopback3, changed state to up

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

R1(config-if)#ip address 10.1.3.10 255.255.255.0
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)#network 10.103.12.0 0.0.0.255 area 5

```

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.

Tabla 2. Interfaces loopback para crear R2

RED	RANGO DE REDES	BROADCAST
172.5.0.0/22	172.5.0.1-172.5.0.254	172.5.0.255
172.5.1.0/22	172.5.1.1-172.5.1.254	172.5.1.255
172.5.2.0/22	172.5.2.1-172.5.2.254	172.5.2.255
172.5.3.0/22	172.5.3.1-172.5.3.254	172.5.3.255

Procedemos a configurar el R5

R5

R5(config)#interface loopback 0	configuramos el loopback 0
R5(config-if)#ip address 10.5.0.10 255.255.255.0	configuramos la ip y la mascara
R5(config-if)#interface loopback 1	configuramos el loopback 1
R5(config-if)#ip address 10.5.1.10 255.255.255.0	configuramos la ip y la mascara
R5(config-if)#interface loopback 2	configuramos el loopback 2
R5(config-if)#ip address 10.5.2.10 255.255.255.0	configuramos la ip y la mascara
R5(config-if)#interface loopback 3	configuramos el loopback 3
R5(config-if)#ip address 10.5.3.10 255.255.255.0	configuramos la ip y la mascara
R5(config-if)#exit	

```

R5(config)#router eigrp 15
R5(config-router)#network 10.5.0.0 0.0.0.255
R5(config-router)#network 10.5.1.0 0.0.0.255
R5(config-router)#network 10.5.2.0 0.0.0.255
R5(config-router)#network 10.5.3.0 0.0.0.255
R3(config)#exit

```

configuramos el router y las ips respectivas

Figura 9. Interfaces de Loopback en R5

```

R5(config-if)#ip address 10.5.0.10 255.255.255.0
R5(config-if)#interface loopback 1

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up

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

R5(config-if)#ip address 10.5.1.10 255.255.255.0
R5(config-if)#interface loopback 2

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback2, changed state to up

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

R5(config-if)#ip address 10.5.2.10 255.255.255.0
R5(config-if)#interface loopback 3

R5(config-if)#
%LINK-5-CHANGED: Interface Loopback3, changed state to up

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

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)#network 10.5.0.0 0.0.0.255
R5(config-router)#network 10.5.1.0 0.0.0.255
R5(config-router)#network 10.5.2.0 0.0.0.255
R5(config-router)#network 10.5.3.0 0.0.0.255
R5(config-router)#exit
R5(config)#|

```

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**.

Figura 10. Interface 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       10.103.23.0/24 is directly connected, Serial0/0/1
L       10.103.23.10/32 is directly connected, Serial0/0/1
    172.29.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       172.29.34.0/24 is directly connected, Serial0/0/0
L       172.29.34.10/32 is directly connected, Serial0/0/0

```

R3 no ha aprendido las redes especificadas. No se actualiza correctamente las entradas.

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
R3(config)#router ospf 1          entramos a la configuracion del router
R3(config-router)#redistribute eigrp 10 metric 50000 subnets
R3(config)#exit
R3(config)#router eigrp 15       entramos a la configuracion de la eigrp
R3(config-router)#redistribute ospf 1 metric 1544 20000 255 1 1500
```

Figura 11. Configuración de R3

```
R3(config)#router ospf 1
R3(config-router)#redistribute eigrp 10 metric 50000 subnets
R3(config-router)#exit
R3(config)#router eigrp 15
R3(config)#router eigrp 15
R3(config-router)#redistribute ospf 1 metric 1544 20000 255 1 1500
R3(config-router)#exit
R3(config)#exit
R3#
```

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 12. Interfaces en R1

```
R1>enable
R1# show ip route.
% Invalid input detected at '^' marker.
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, 11 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       10.103.12.0/24 is directly connected, Serial10/0/0
L       10.103.12.10/32 is directly connected, Serial10/0/0
O       10.103.23.0/24 [110/65] via 10.103.12.20, 00:09:48, Serial10/0/0

R1#
```

Figura 13. Interfaces en R5

```
R5>enable
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
172.29.0.0/16 is variably subnetted, 3 subnets, 2 masks
D    172.29.34.0/24 [90/2681856] via 172.29.45.20, 00:59:32, Serial10/0/1
C    172.29.45.0/24 is directly connected, Serial10/0/1
L    172.29.45.10/32 is directly connected, Serial10/0/1

R5#
```

## 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

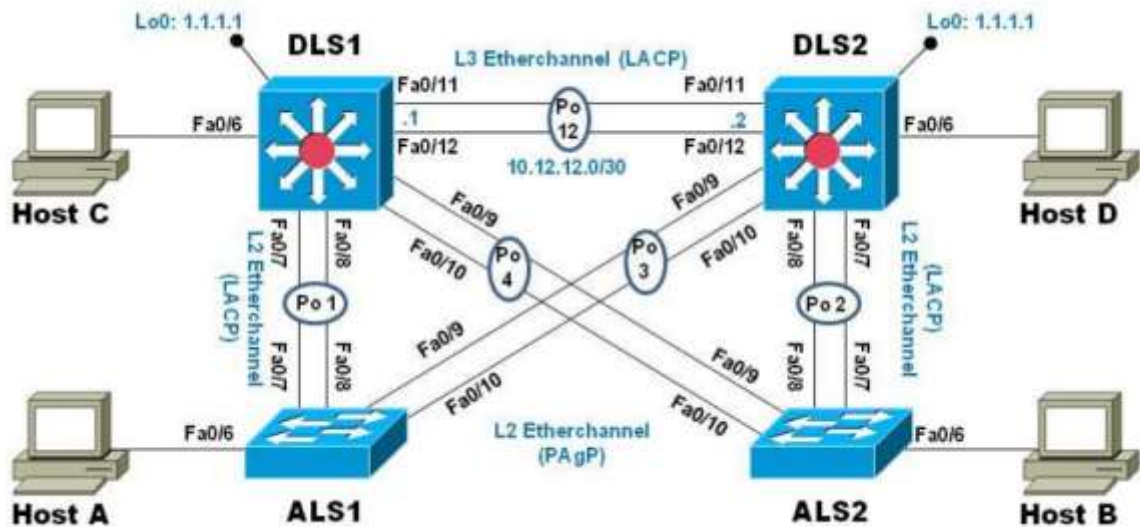
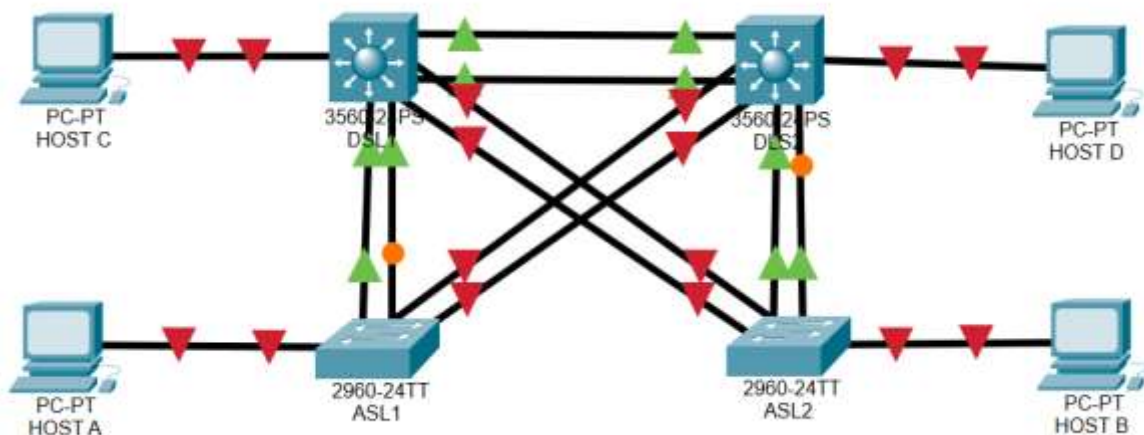


Figura 15. SIMULACION DE ESCENARIO 2



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

- a. Apagar todas las interfaces en cada switch.
- b. Asignar un nombre a cada switch acorde con el escenario establecido.

DLS1

```
Switch>enable
```

```
Switch#configure terminal
```

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

```
Switch(config)#hostname DSL1      configuramos el dsl y le asignamos el nombre
```

```
DSL1(config)#
```

```
DSL1(config)#int ran f0/1-24, g0/1-2  configuramos los rangos totales de salida del router
```

```
DSL1(config-if-range)#shutdown    los apagamos
```

```
%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
```

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

```
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down
```



%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down  
DSL1(config-if-range)#

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down

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

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down

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

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

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down

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

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

Figura 16. Configuración del DSL1

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DSL1
DSL1(config)#
DSL1(config)#int ran f0/1-24, g0/1-2
DSL1(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
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
```

## DSL2

```
Switch>enable
```

```
Switch#configure terminal
```

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

```
Switch(config)#hostname DLS2 nombramos el switch
```

```
DLS2(config)#
```

```
%LINK-3-UPDOWN: Interface FastEthernet0/11, changed state to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down
```

```
%LINK-3-UPDOWN: Interface FastEthernet0/12, changed state to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down
```

```
DLS2(config)#int ran f0/1-24, g0/1-2 seleccionamos todos los puertos
```

```
DLS2(config-if-range)#shutdown los apagamos
```

```
%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
```

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

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down  
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down  
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down  
DLS2(config-if-range)#  
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down  
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to administratively down  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to down  
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to administratively down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to down

DLS2#

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

Figura 17. Configuración código R2

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DLS2
DLS2(config)#
%LINK-3-UPDOWN: Interface FastEthernet0/11, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/11, changed state to down

%LINK-3-UPDOWN: Interface FastEthernet0/12, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/12, changed state to down

DLS2(config)#int ran f0/1-24, g0/1-2
DLS2(config-if-range)#shutdown
```

ASL1

Switch>E

Switch>enable

Switch#configure terminal

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

Switch(config)#hostname ASL1 configuramos el nombre de R3

ASL1>ENABLE

ASL1#config

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

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

ASL1(config)#int ran f0/1-24, g0/1-2 seleccionamos todos los puertos

ASL1(config-if-range)#shutdown los apagamos

%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

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

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

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

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down  
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down  
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down  
ASL1(config-if-range)#  
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down

Figura 18. Configuración código R3

```
ASL1>ENABLE
ASL1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
ASL1(config)#int ran f0/1-24, g0/1-2
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
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
```

ASL2

Switch>enable

Switch#configure terminal

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

Switch(config)#hostname ASL2 nombramos el ASL2 del switch

ASL2(config)#

ASL2#config

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

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

ASL2(config)#int ran f0/1-24, g0/1-2 seleccionamos todos los puertos

ASL2(config-if-range)#shutdown apagamos todos los puertos

%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

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

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

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

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

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to administratively down  
%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to administratively down  
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down  
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down  
ASL2(config-if-range)#  
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down

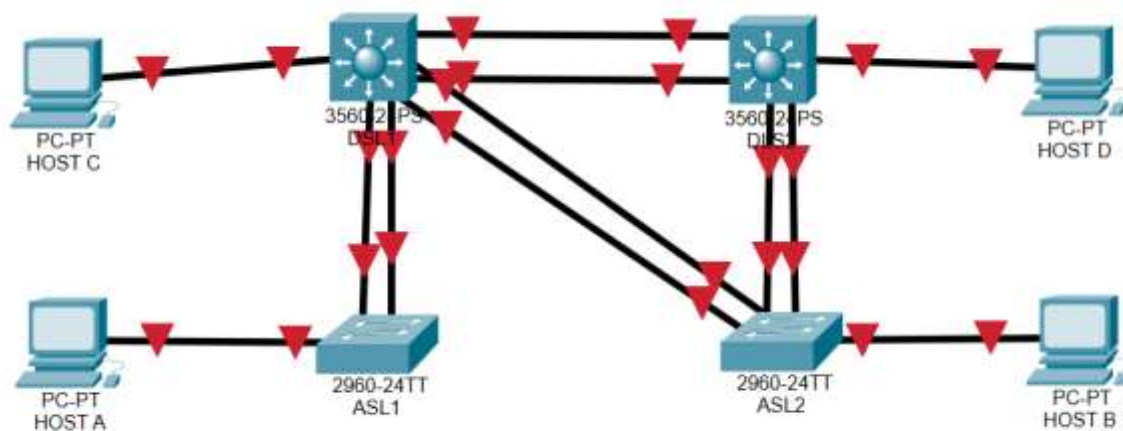
Figura 19. Configuración código R4

```

ASL2#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
ASL2(config)#int ran f0/1-24, g0/1-2
ASL2(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
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down
    
```

Figura 20. Red de conexiones todo apagado



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.

```

DSL1#conf ter          entramos a la configuracion del terminal
Enter configuration commands, one per line. End with CNTL/Z.
DSL1(config)#interface port-channel 12    configuramos el Puerto de canal 12
DSL1(config-if)#no switchport
DSL1(config-if)#ip address 10.12.12.1 255.255.255.252  configuramos ip y mascara
DSL1(config-if)#exit
DSL1(config)#interface range fa0/11-12  seleccionamos el rango de puertos
DSL1(config-if-range)#no switchport
DSL1(config-if-range)#channel-group 12 mode active lo agripamos al canal 12
    
```



```
DSL1(config-if-range)#  
DSL1(config-if-range)#exit
```

Figura 21. CONFIGURACION DLS1

```
DSL1#  
DSL1#conf ter  
Enter configuration commands, one per line. End with CNTL/Z.  
DSL1(config)#interface port-channel 12  
DSL1(config-if)#no switchport  
DSL1(config-if)#ip address 10.12.12.1 255.255.255.252  
DSL1(config-if)#exit  
DSL1(config)#interface range fa0/11-12  
DSL1(config-if-range)#no switchport  
DSL1(config-if-range)#channel-group 12 mode active  
DSL1(config-if-range)#  
%EC-5-CANNOT_BUNDLE2: Fa0/11 is not compatible with Po12 and will be suspended (native vlan of  
Fa0/11 is 500, Po12 id 1)  
  
%EC-5-CANNOT_BUNDLE2: Fa0/12 is not compatible with Fa0/11 and will be suspended (trunk encap of  
Fa0/12 is auto, Fa0/11 is dot1q)  
  
DSL1(config-if-range)#exit  
DSL1(config)#exit  
*****
```

```
DLS2(config)#int range f0/11-12  
DLS2(config-if-range)#channel-group 12 mode active  
DLS2(config-if-range)#  
Creating a port-channel interface Port-channel 12
```

%EC-5-CANNOT\_BUNDLE2: Fa0/11 is not compatible with Po12 and will be suspended (native  
vlan of Fa0/11 is 500, Po12 id 1)

%EC-5-CANNOT\_BUNDLE2: Fa0/12 is not compatible with Fa0/11 and will be suspended  
(trunk encap of Fa0/12 is auto, Fa0/11 is dot1q)

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

Figura 22. Configuracion DLS2

```
DLS2(config)#int range f0/11-12  
DLS2(config-if-range)#channel-group 12 mode active  
DLS2(config-if-range)#  
Creating a port-channel interface Port-channel 12  
  
%EC-5-CANNOT_BUNDLE2: Fa0/11 is not compatible with Po12 and will be suspended (native vlan of  
Fa0/11 is 500, Po12 id 1)  
  
%EC-5-CANNOT_BUNDLE2: Fa0/12 is not compatible with Fa0/11 and will be suspended (trunk encap of  
Fa0/12 is auto, Fa0/11 is dot1q)  
  
DLS2(config-if-range)#no sh  
|
```

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

```
DSL1(config)#int range f0/7-8
DSL1(config-if-range)#channel-group 1 mode active
DSL1(config-if-range)#
Creating a port-channel interface Port-channel 1
```

```
DSL1(config-if-range)#no sh
```

Figura 23. Configuración DSL1 para 7 y 8

```
DSL1(config-if)#exit
DSL1(config)#int range f0/7-8
DSL1(config-if-range)#channel-group 1 mode active
DSL1(config-if-range)#
Creating a port-channel interface Port-channel 1

%EC-5-CANNOT_BUNDLE2: Fa0/7 is not compatible with Pol and will be suspended (native vlan of Fa0/7
is 500, Pol id 1)

%EC-5-CANNOT_BUNDLE2: Fa0/8 is not compatible with Pol and will be suspended (native vlan of Fa0/8
is 500, Pol id 1)

DSL1(config-if-range)#no sh

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

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
DSL1(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/8, changed state to up

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ASL1
FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ASL1
FastEthernet0/8 (1).
```

```
ASL1>enable
ASL1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
ASL1(config)#int range f0/7-8
ASL1(config-if-range)#channel-group 1 mode active
ASL1(config-if-range)#
Creating a port-channel interface Port-channel 1
```

```
ASL1(config-if-range)#no sh
```

Figura 24. Configuración de R3

```
ASL1>enable
ASL1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
ASL1(config)#int range f0/7-8
ASL1(config-if-range)#channel-group 1 mode active
^
% Invalid input detected at '^' marker.

ASL1(config-if-range)#channel-group 1 mode active
ASL1(config-if-range)#
Creating a port-channel interface Port-channel 1
|
ASL1(config-if-range)#no sh
```

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

```
DSL1#conf term
Enter configuration commands, one per line. End with CNTL/Z.
DSL1(config)#int ran fa0/9-10
DSL1(config-if-range)#switchport trunk encapsulation dot1q
DSL1(config-if-range)#

DSL1(config-if-range)#switchport mode trunk
DSL1(config-if-range)#
DSL1(config-if-range)#channel-group 1 mode active
DSL1(config-if-range)#
DSL1(config-if-range)#no shutdown

DSL1(config-if-range)#
DSL1(config-if-range)#exit

DSL1(config)#exit
```

Figura 25.

```
DSL1#conf term
Enter configuration commands, one per line. End with CNTL/Z.
DSL1(config)#
DSL1(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ASL1
FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ASL1
FastEthernet0/8 (1).
int ran fa0/9-10
DSL1(config-if-range)#switchport trunk encapsulation dot1q
DSL1(config-if-range)#switchport mode trunk
DSL1(config-if-range)#channel-group 1 mode active
DSL1(config-if-range)#
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Po1 and will be suspended (native vlan of Fa0/9
is 500, Po1 id 1)

%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Po1 and will be suspended (native vlan of Fa0/10
is 500, Po1 id 1)

DSL1(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
DSL1(config-if-range)#
```

Figura 26. Configuración de DSL2

```
DLS2>enable
DLS2#conf term
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ASL2
FastEthernet0/8 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ASL2
FastEthernet0/7 (1).
int ran fa0/9-10
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#channel-group 1 mode active
DLS2(config-if-range)#
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Po1 and will be suspended (native vlan of Fa0/9
is 500, Po1 id 1)

%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Po1 and will be suspended (native vlan of Fa0/10
is 500, Po1 id 1)

DLS2(config-if-range)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
DLS2(config-if-range)#
DLS2(config-if-range)#exit
DLS2(config)#exit
DLS2#
```

Figura 27. configuracion de ASL1

```
ASL1>enable
ASL1#conf term
Enter configuration commands, one per line. End with CNTL/Z.
ASL1(config)#
ASL1(config)#int ran fa0/9-10
ASL1(config-if-range)#switchport trunk encapsulation dot1q

% Invalid input detected at '^' marker.

ASL1(config-if-range)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DSL1
FastEthernet0/7 (500).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DSL1
FastEthernet0/8 (500).

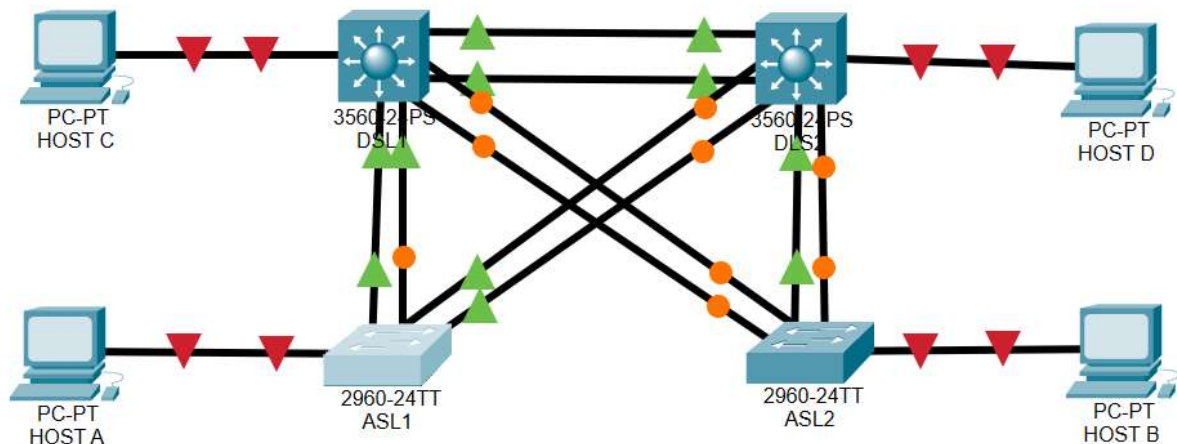
ASL1(config-if-range)#switchport mode trunk
ASL1(config-if-range)#channel-group 1 mode active
ASL1(config-if-range)#
%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/7 and will be suspended (dtp mode of Fa0/9 is
on, Fa0/7is off )

%EC-5-CANNOT_BUNDLE2: Fa0/9 is not compatible with Fa0/8 and will be suspended (dtp mode of Fa0/9 is
on, Fa0/8is off )

%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/7 and will be suspended (dtp mode of Fa0/10
is on, Fa0/7is off )

%EC-5-CANNOT_BUNDLE2: Fa0/10 is not compatible with Fa0/8 and will be suspended (dtp mode of Fa0/10
is on, Fa0/8is off )
```

Figura 28. Simulación de las conexión entre routers



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

```
DLS1#conf ter
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
```

```
DLS2(config)#interface fastethernet0/7
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/8
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/9
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/10
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/11
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#
```

Figura 29. Configuración de DLS2

```
DLS2(config)#interface fastethernet0/7
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/8
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/9
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/10
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
DLS2(config)#interface fastethernet0/11
DLS2(config-if)#switchport trunk native vlan 500
DLS2(config-if)#switchport mode trunk
DLS2(config-if)#switchport nonegotiate
DLS2(config-if)#exit
```

```
DSL1(config)#interface fastethernet0/7
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/8
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/9
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/10
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/11
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
```

```
DSL1(config-if)#exit
DSL1(config)#
DSL1#
%SYS-5-CONFIG_I: Configured from console by console
```

Figura 30. Configuración de DSL1

```
DSL1(config)#interface fastethernet0/7
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/8
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/9
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/10
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#interface fastethernet0/11
DSL1(config-if)#switchport trunk native vlan 500
DSL1(config-if)#switchport mode trunk
DSL1(config-if)#switchport nonegotiate
DSL1(config-if)#exit
DSL1(config)#
DSL1#
```

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

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

```
DLS1(config)#vtp domain CISCO
Domain name already set to CISCO.
DLS1(config)#vtp pass ccnp321
Setting device VLAN database password to ccnp321
DLS1(config)#vtp version 2
```



Figura 31. Configuración de claves DSL1

```
DSL1(config)#vtp domain CISCO
Changing VTP domain name from NWL to CISCO
DSL1(config)#vtp pass ccmp321
Password already set to ccmp321
DSL1(config)#02:27:39 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/7
because of VTP domain mismatch.

02:27:40 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/8 because of VTP
domain mismatch.

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ASL2
FastEthernet0/9 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ASL2
FastEthernet0/10 (1).
02:27:43 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/9 because of VTP
domain mismatch.

02:27:43 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/10 because of VTP
domain mismatch.

vtp version 2
VTP mode already in V2.
DSL1(config)#
DSL1(config)#
```

2) Configurar DLS1 como servidor principal para las VLAN.

DSL1#conf t

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

DSL1(config)#vtp mode server

Figura 32. Vtp principal

```
Device mode already VTP SERVER.
```

3) Configurar ALS1 y ALS2 como clientes VTP.

DSL1#conf t

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

DSL1(config)#vtp mode client

Figura 33. Configuración vtp cliente

```
ASL1(config)#vtp mode client
Setting device to VTP CLIENT mode.
ASL2(config)#vtp mode client
Setting device to VTP CLIENT mode.
```

e. Configurar en el servidor principal las siguientes VLAN:

tabla 3. Loopback para crear R3

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

```
DSL1(config)#VLAN 500
DSL1(config-vlan)#NAME NATIVA
DSL1(config)#VLAN 434
DSL1(config-vlan)#NAME PROVEEDORES
DSL1(config)#VLAN 12
DSL1(config-vlan)#NAME ADMON
DSL1(config)#VLAN 123
DSL1(config-vlan)#NAME SEGUROS
```

```
DSL1(config)#VLAN 234
DSL1(config-vlan)#NAME CLIENTES
DSL1(config)#VLAN 1010
DSL1(config-vlan)#NAME VENTAS
DSL1(config)#VLAN 1111
DSL1(config-vlan)#NAME MULTIMEDIA
DSL1(config)#VLAN 3456
DSL1(config-vlan)#NAME PERSONAL
```

Figura 34. Configuración de vlan

```
DSL1(config-vlan)#NAME ADMON
DSL1(config-vlan)#EXIT
DSL1(config)#VLAN 123
DSL1(config-vlan)#NAME SEGUROS
```

f. En DLS1, suspender la VLAN 434.

No vlan 434

Figura 35. Suspensión de vlan 434

```
-----
DSL1(vlan)#
%SYS-5-CONFIG_I: Configured from console by console
no vlan 434
Deleting VLAN 434...
DSL1(vlan)#
```

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

```
DLS2#conf t
DLS2(config)# vtp mode transparent
Setting device to VTP TRANSPARENT mode.
```

```
DSL2(config)#VLAN 500
DSL2(config-vlan)#NAME NATIVA
DSL2(config)#VLAN 434
DSL2(config-vlan)#NAME PROVEEDORES
DSL2(config)#VLAN 12
DSL2(config-vlan)#NAME ADMON
DSL2(config)#VLAN 123
DSL2(config-vlan)#NAME SEGUROS
```

```
DSL2(config)#VLAN 234
DSL2(config-vlan)#NAME CLIENTES
DSL2(config)#VLAN 1010
DSL2(config-vlan)#NAME VENTAS
DSL2(config)#VLAN 1111
DSL2(config-vlan)#NAME MULTIMEDIA
DSL2(config)#VLAN 3456
DSL2(config-vlan)#NAME PERSONAL
```

Figura 36. Configuración VLAN en R2

```

DLS2(config-vlan)#NAME MULTIMEDIA
DLS2(config-vlan)#VLAN 3456
DLS2(config-vlan)#NAME PERSONAL
DLS2(config-vlan)#exit
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

```

h. Suspender VLAN 434 en DLS2.

```
DLS2(config)#vlan 434
DLS2(vlan)#no vlan 434
```

Figura 37. Suspensión de vlan 434 en R2

```
DLS2(vlan)#no vlan 434
Deleting VLAN 434...
DLS2(vlan)#
```

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#conf t
DSL2(config)#INTERFACE PORT-CHANNEL 2
DSL2(config)#SWITCHPORT TRUNK ALLOWED VLAN EXCEPT 567
DSL2(config)#EXIT
DSL2(config)#INT PORT-CHANNEL 3
DSL2(config)#SWITCHPORT TRUNK ALLOWED VLAN EXCEPT 567
DSL2(config)#EXIT
```

```
DSL2(config)#VLAN 567
DSL2(config-vlan)#NAME PRODUCCION
```

```
DSL2(config-vlan)#exit
```

Figura 38. Configuración de DSL2 de vlan 567

```
FastEthernet0/10 (1).
INT PORT-CHANNEL 3
DLS2(config-if)#SWITCHPORT TRUNK ALLOWED VLAN EXCEPT 567
DLS2(config-if)#EXIT
DLS2(config)#VLAN 567
DLS2(config-vlan)#NAME PRODUCCION
DLS2(config-vlan)#exit
DLS2(config)#ex
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (500), with ASL2
FastEthernet0/7 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (500), with ASL2
FastEthernet0/8 (1).
it
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
```

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.

```
DSL1(config)#spanning-tree vlan 1,12,434,500,1010,1111,3456 root primary
DSL1(config)#spanning-tree vlan 123,234 root secondary}
```

Figura 39. Configuración del spanning-tree

```
spanning-tree vlan 123,234 root secondary
DSL1(config)#
```

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.

```
DSL2(config)#spanning-tree vlan 123,234 root primary
DSL2(config)#spanning-tree vlan 1,12,434,500,1010,1111,3456 root secondary
```

Figura 40. Configuración de spanning-tree en R2

```
DSL2(config)#spanning-tree vlan 123,234 root primary
DSL2(config)#spanning-tree vlan 1,12,434,500,1010,1111,3456 root secondary
DSL2(config)#
```

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

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

tabla 4 Loopback para crear R4

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

```
DLS1#conf
DSL1(config)#INTERFACE fa0/6
DSL1(config-if)#switchport access vlan 3456
DSL1(config-if)#spanning-tree portfast
DSL1(config-if)#no sh
DSL1(config)#INTERFACE fa0/15
DSL1(config-if)#switchport access vlan 1111
DSL1(config-if)#spanning-tree portfast
DSL1(config-if)#no sh
```

Figura 41. Configuración de las interfaces de R1

```
INTERFACE fa0/15
DSL1(config-if)#switchport access vlan 1111
% Access VLAN does not exist. Creating vlan 1111
DSL1(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.
DSL1(config-if)#
DSL1(config-if)#
DSL1(config-if)#no sh

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to down
DSL1(config-if)#
```

```
DLS2#conf
DSL2(config)#INTERFACE fa0/6
DSL2(config-if)#switchport access vlan 12
DSL2(config-if)#spanning-tree portfast
DSL2(config-if)#switchport access vlan 1010
DSL2(config-if)#spanning-tree portfast
DSL2(config-if)#no sh
DSL2(config)#INTERFACE fa0/15
DSL2(config-if)#switchport access vlan 1111
DSL2(config-if)#spanning-tree portfast
DSL2(config-if)#no sh
DSL2(config)#INTERFACE fa0/16-18
DSL2(config-if)#switchport access vlan 567
DSL2(config-if)#spanning-tree portfast
DSL2(config-if)#no sh
DSL2(config)#INTERFACE fa0/17
DSL2(config-if)#switchport access vlan 567
DSL2(config-if)#spanning-tree portfast
DSL2(config-if)#no sh

DSL2(config)#INTERFACE fa0/18
DSL2(config-if)#switchport access vlan 567
DSL2(config-if)#spanning-tree portfast
DSL2(config-if)#no sh
```

Figura 42. Configuración de las interfaces R2

```
DLS2(config-if)#exit
DLS2(config)#
DLS2(config)#INTERFACE fa0/18
DLS2(config-if)#switchport access vlan 567
DLS2(config-if)#switchport access vlan 567
DLS2(config-if)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (500), with ASL1
FastEthernet0/9 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (500), with ASL1
FastEthernet0/10 (1).
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 FastEthernet0/18 but will only
have effect when the interface is in a non-trunking mode.
DLS2(config-if)#no sh

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to down
DLS2(config-if)#exit
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
ALS1#conf
ALS1 (config)#INTERFACE fa0/6
ALS1 (config-if)#switchport access vlan 123
ALS1 (config-if)#spanning-tree portfast
ALS1 (config-if)#no sh
ALS1 (config-if)#switchport access vlan 1010
ALS1 (config-if) #spanning-tree portfast
ALS1 (config-if) #no shy
ALS1 (config) #INTERFACE fa0/15
ALS1 (config-if) #switch port access plan 1111
ALS1 (config-if) #spanning-tree port fast
ALS1 (config-if) #no shy
```

Figura 43. Configuración de interfaces R3

```
ASL1(config-if)#
ASL1(config-if)#no sh
ASL1(config-if)#INTERFACE fa0/15
ASL1(config-if)#switchport access vlan 1111
ASL1(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.
ASL1(config-if)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (1), with DLS2
FastEthernet0/9 (500).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (1), with DLS2
FastEthernet0/10 (500).

ASL1(config-if)#no sh

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to down
ASL1(config-if)#exit
ASL1(config)#exit
ASL1#
%SYS-5-CONFIG_I: Configured from console by console

ASL1#
```

```
ALS2#conf
ALS2 (config) #INTERFACE fa0/6
ALS2 (config-if) #switch port access plan 234
ALS2 (config-if) #spanning-tree port fast
ALS2 (config-if) #no shy
ALS2 (config) #INTERFACE fa0/15
ALS2 (config-if) #switch port access plan 1111
ALS2 (config-if) #spanning-tree port fast
ALS2 (config-if) #no shy
```

Figura 44. Configuración de interfaces R4



```

switchport access vlan 1111
ASL2(config-if)#
ASL2(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.
ASL2(config-if)#
ASL2(config-if)#no sh

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to down
ASL2(config-if)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/9 (1), with DSL1
FastEthernet0/9 (500).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (1), with DSL1
FastEthernet0/10 (500).

```

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 45.verificacion de las interfaces R1

```

DSL1>enable
DSL1#show interface trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/6     on        802.1q         trunking    1

Port      Vlans allowed on trunk
Fa0/6     1-1005

Port      Vlans allowed and active in management domain
Fa0/6     1,12,123,234,500

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/6     1,12,123,234,500

DSL1#03:39:40 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/7 because of VTP
domain mismatch.

03:39:41 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/8 because of VTP
domain mismatch.

03:39:44 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/9 because of VTP
domain mismatch.

03:39:44 %DTP-5-DOMAINMISMATCH: Unable to perform trunk negotiation on port Fa0/10 because of VTP
domain mismatch.

```

Figura 46. Verificacion de la VLAN R1

VLAN Name	Status	Ports
1 default	active	Pol, Po4, 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 ADMON	active	
123 SEGUROS	active	
234 CLIENTES	active	
500 NATIVA	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	
1111 VLAN1111	active	Fa0/15
3456 VLAN3456	active	

VLAN Type	SAID	MTU	Parent RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2

Figura 47. Verificacion VLAN R2

VLAN Name	Status	Ports
1 default	active	Pol, Po2, Po3, Po12 Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/12, Fa0/13, Fa0/14 Fa0/19, Fa0/20, Fa0/21, Fa0/22 Fa0/23, Fa0/24, Gig0/1, Gig0/2
12 ADMON	active	
123 SEGUROS	active	
234 CLIENTES	active	
500 NATIVA	active	
567 PRODUCCION	active	Fa0/16, Fa0/17, Fa0/18
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	
1010 VENTAS	active	Fa0/6
1111 MULTIMEDIA	active	Fa0/15
3456 PERSONAL	active	

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

Usamos los comandos show etherchannel summary

Figura 48. Verificación de chanel en R1

```

DSLI#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(SU)          LACP Fa0/7(I) Fa0/8(I) Fa0/9(B) Fa0/10(B)
4      Po4(SD)          -
12     Po12(RD)         -

```

Figura 49. Verificación de canal en R3

```

VLAN MISMATCH LOW RESOLVE
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/10 (1), with DLS2
FastEthernet0/10 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS1
FastEthernet0/7 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with DLS1
FastEthernet0/8 (500).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with DLS1 Port-
channel1 (500).

ASLI>enable
ASLI#
ASLI#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: 1
Number of aggregators:          1

Group Port-channel Protocol Ports
-----
1      Po1(SD)          LACP Fa0/7(I) Fa0/8(I) Fa0/9(I) Fa0/10(I)
ASLI#

```

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

Usamos el código show spanning-tree

Figura 50. show spanning-tree R1

```

Spanning tree enabled protocol ieee
Root ID    Priority    24577
           Address    0001.42B5.9212
           This bridge is the root
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

Bridge ID  Priority    24577 (priority 24576 sys-id-ext 1)
           Address    0001.42B5.9212
           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
Fa0/7     Desg FWD 19        128.7   P2p
Fa0/8     Desg FWD 19        128.8   P2p
Po1       Desg FWD 7         128.27  Shr

VLAN0012
Spanning tree enabled protocol ieee
Root ID    Priority    24588
           Address    0001.42B5.9212
           This bridge is the root
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

```

Figura 51. show spanning-tree R2

```

Spanning tree enabled protocol ieee
Root ID    Priority    24577
           Address    0001.42B5.9212
           Cost        38
           Port        9(FastEthernet0/9)
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

Bridge ID  Priority    28673 (priority 28672 sys-id-ext 1)
           Address    00D0.D3B6.B3C6
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
           Aging Time 20

Interface  Role Sts Cost      Prio.Nbr Type
-----
Fa0/8     Desg BKN*19      128.8   P2p *PVID_Inc
Fa0/10    Altn BLK 19        128.10  P2p
Fa0/7     Desg BKN*19      128.7   P2p *PVID_Inc
Fa0/9     Root BKN*19      128.9   P2p *PVID_Inc
Fa0/11    Desg FWD 19        128.11  P2p
Fa0/12    Desg FWD 19        128.12  P2p

VLAN0012
Spanning tree enabled protocol ieee
Root ID    Priority    28684
           Address    00D0.D3B6.B3C6
           This bridge is the root
           Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

Bridge ID  Priority    28684 (priority 28672 sys-id-ext 12)
           Address    00D0.D3B6.B3C6

```

## CONCLUSIONES

La programación de un router por medio de cualquier software de gestión de redes o similitudes tiene que ser preciso ya que esto nos va a ayudar a que todo trabaje correctamente, el modelo del router a elegir tiene que ser el ideal a su vez que la versión del software utilizado ya que algunos comandos no funcionan con modelos o versiones obsoletas.

Algunas configuraciones no funcionan, aunque el código sea correctamente utilizado y se requiere reiniciar el proceso o efectuar nuevamente el código para que funcione la codificación de manera adecuada ya que a veces tienden a fallar los progresos.

La importancia de las configuraciones CCNP es que permite reducir los loops que se generan permitiendo que la red funcione de manera fluida y sin mucho problema. Buscamos la manera de que todo el sistema funcione de manera rápida y adecuada.

Los desarrollos de estas simulaciones están enfocados para el proceso de las redes y poder enfocar nuestros conocimientos y aptitudes para el desarrollo de la red.

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