

**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 DE TELECOMUNICACIONES
BOGOTÁ D.C.
2020**

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

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2020**

NOTA DE ACEPTACIÓN

Firma del Presidente del Jurado

Firma del Jurado

Firma del Jurado

BOGOTÁ D.C., 30 de noviembre de 2020

AGRADECIMIENTOS

El presente trabajo se lo dedico a Dios, por brindarnos fuerza y sabiduría para continuar con este proceso.

También a mis padres quien con su apoyo y sacrificio incondicional se ha logrado llegar a esta instancia.

A mi hermana que, con su compañía y apoyo, que me brindo a lo largo de esta etapa de mi vida.

A las diferentes personas que dentro de este proceso me han brindado apoyo y han hecho que este trabajo se realice con éxito.

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GLOSARIO

Cisco: Empresa fabricante de dispositivos para redes locales y externa, acorde con su propio lenguaje de programación para cada uno de sus dispositivos.

CCNP: (Cisco Certified Network Professional) Programa de certificación de nivel profesional en sistemas Cisco

Networking: Una red consiste en dos o más computadoras unidas que comparten recursos como archivos, CD-Roms o impresoras, y que son capaces de realizar comunicaciones electrónicas. Las redes están unidas por cable, líneas de teléfono, ondas de radio, satélite, etc.

Enrutamiento: El enrutamiento o ruteo es la función de buscar un camino entre todos los posibles en una red de paquetes cuyas topologías poseen una gran conectividad.

Conmutación: Se considera como la acción de establecer una vía, un camino, de extremo a extremo entre dos puntos, un emisor y un receptor a través de nodos o equipos de transmisión.

Redes: Conjunto de establecimientos de un mismo ramo, y en ocasiones bajo una misma dirección, que se distribuyen por varios lugares de una localidad o zona geográfica para prestar un servicio.

Protocolo: Un protocolo de comunicaciones es un sistema de reglas que permiten que dos o más entidades de un sistema de comunicación se comuniquen entre ellas para transmitir información por medio de cualquier tipo de variación de una magnitud física.

RESUMEN

En el presente trabajo se implementó la ejecución de dos escenarios, en donde se simulará en el programa GNS3. Se aplicarán los diferentes métodos de enrutamiento y conmutación que fueron abordados en el transcurso del diplomado de Cisco CCNP para el manejo de las redes.

Se abordarán conceptos principales como protocolos de enrutamiento EIGRP, OSPF.

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

ABSTRACT

In the present work, the execution of two scenarios was implemented, where it will be simulated in the GNS3 program. The different routing and switching methods that were addressed during the course of the Cisco CCNP diploma course for network management will be applied.

Main concepts such as EIGRP, OSPF routing protocols will be addressed.

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

INTRODUCCIÓN

En el presente trabajo se aborda la correspondiente temática con respecto al contenido visto durante el curso; a partir de estos conceptos se abordarán dos escenarios los cuales contemplarán diferentes elementos a configurar, para establecer un proceso de comunicación y de interacción entre los elementos lo anterior por medio de las parametrizaciones exigidas.

Ambos escenarios serán simulados por medio del programa GNS3, el cual permite tener un entorno cercano a la realidad del procedimiento de configuración por medio de los comandos pertinentes y permitiendo que durante el desarrollo del trabajo se observe la aplicación de métodos de enrutamiento y conmutación los cuales fueron abordados en el transcurso del diplomado de Cisco CCNP para el manejo de redes.

Se verificará y comprobará el correspondiente procedimiento por medio de diferentes comandos, lo cual es muy importante ya que llevara a identificar que las diferentes configuraciones realizadas fueron correctas.

DESARROLLO

1. ESCENARIO 1

En este escenario se puede observar la configuración entre cinco routers los cuales R1, R2 y R3 están organizados en modo OSPF y R4 y R5 están organizados en EIGRP, cada router cuenta con una configuración específica; el objetivo de tener esta organización es realizar un reconocimiento entre los routers que permita obtener una red con diferentes puntos de comunicación entre los sectores involucrados.

Figura 1. Escenario 1

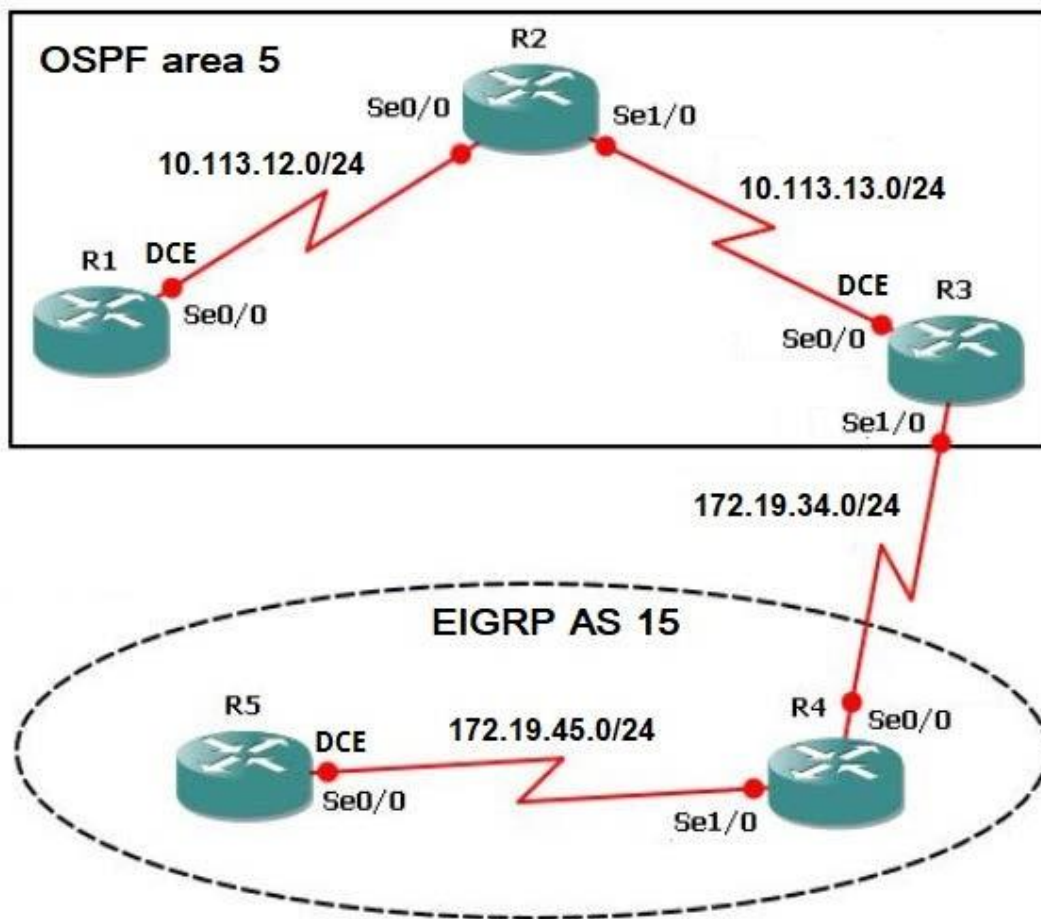
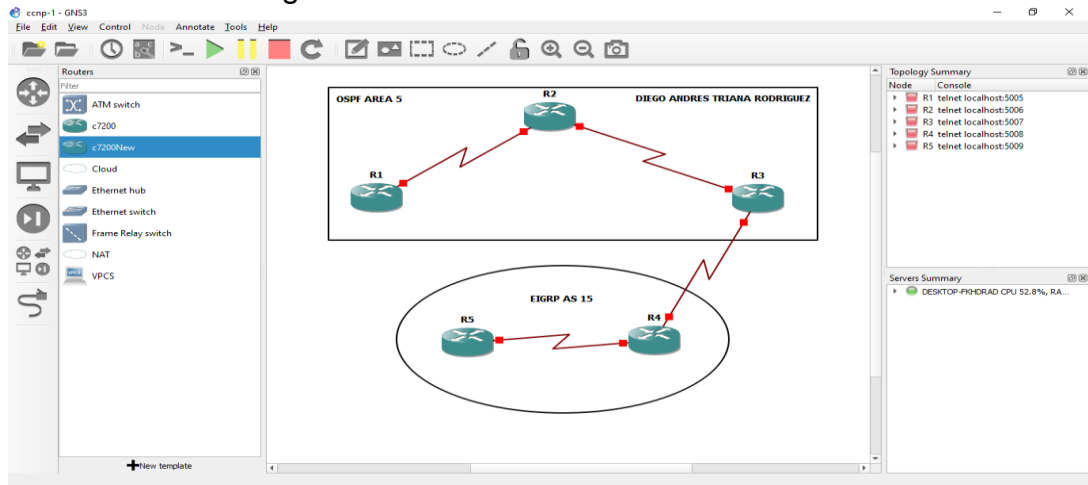


Figura 2. Simulación de escenario 1



Para la simulación del escenario se utiliza el programa GNS3, el cual permite realizar una simulación exitosa, debido a que contempla los comandos que requiere el escenario proporcionado a simular.

Tabla 1. Interfaces Routers

Router	Interfaz	Dirección IP
R1	serial 1/0	10.113.12.2
R2	serial 1/0	10.113.12.1
R2	serial 1/1	10.113.13.2
R3	serial 1/0	10.113.13.1
R3	serial 1/1	172.19.34.2
R4	serial 1/0	172.19.34.1
R4	serial 1/1	172.19.45.2
R5	serial 1/0	172.19.45.1

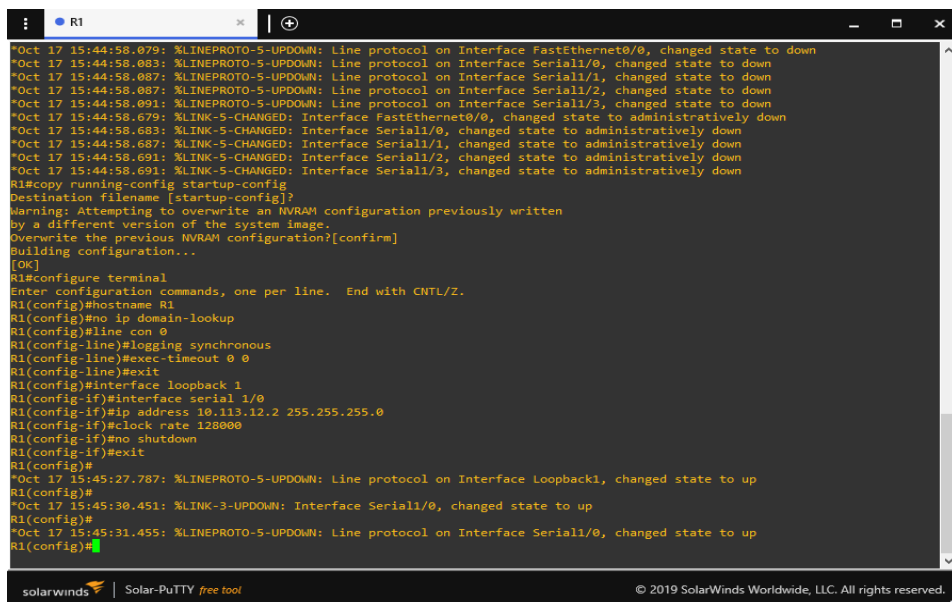
En este ejercicio de simulación se aplicarán las interfaces de la Tabla 1, estas interfaces fueron proporcionadas para el desarrollo del ejercicio y en la misma se evidencia cada interfaz para cada Router.

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.

Configuración R1

```
configure terminal
hostname R1
no ip domain-lookup
line con 0
logging synchronous
exec-timeout 0 0
exit
interface loopback 1
interface serial 1/0
ip address 10.113.12.2 255.255.255.0
clock rate 128000
no shutdown
exit
```

Figura 3. Configuración 1.1 Router 1



```
R1
Oct 17 15:44:58.079: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to down
Oct 17 15:44:58.083: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
Oct 17 15:44:58.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
Oct 17 15:44:58.087: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2, changed state to down
Oct 17 15:44:58.091: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
Oct 17 15:44:58.679: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
Oct 17 15:44:58.683: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
Oct 17 15:44:58.687: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
Oct 17 15:44:58.691: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
Oct 17 15:44:58.691: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
R1#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#line con 0
R1(config-line)#logging synchronous
R1(config-line)#exec-timeout 0 0
R1(config-line)#exit
R1(config)#interface loopback 1
R1(config-if)#interface serial 1/0
R1(config-if)#ip address 10.113.12.2 255.255.255.0
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
Oct 17 15:45:27.787: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up
R1(config)#
Oct 17 15:45:30.451: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R1(config)#
Oct 17 15:45:31.455: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R1(config)#
```

```
Router ospf 1
router-id 1.1.1.1
network 10.1.0.0 0.0.3.255 area 5
network 10.113.12.0 0.0.0.255 area 5
exit
exit
copy running-config startup-config
```

Figura 4. Configuración 1.2 Router 1



```
R1 con0 is now available

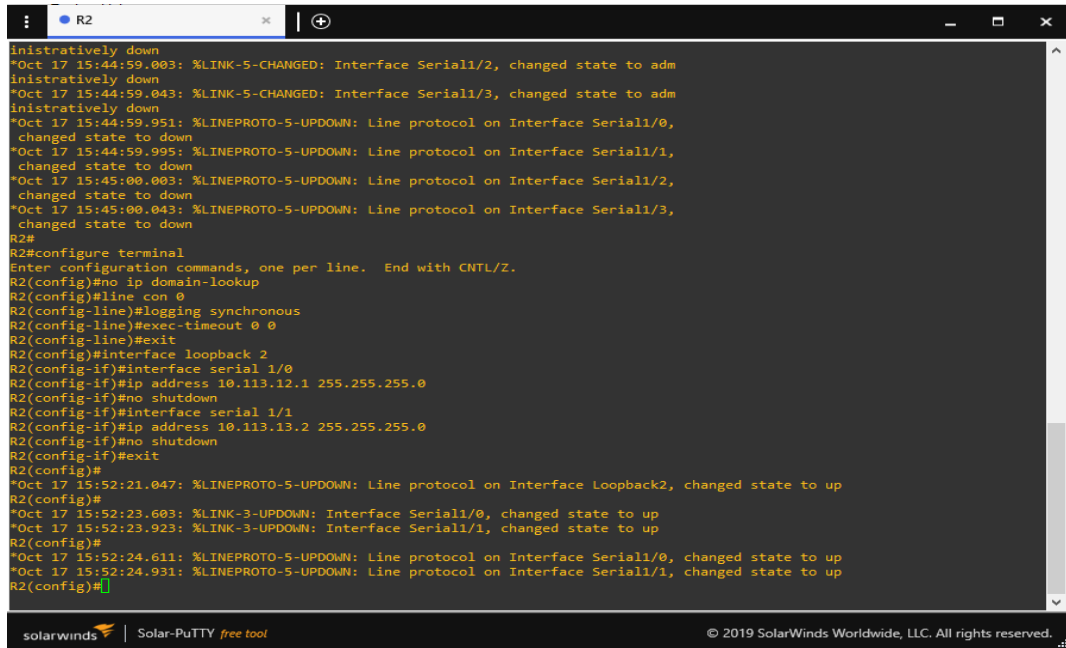
Press RETURN to get started.

*Oct 17 15:46:06.923: %SYS-5-CONFIG_I: Configured from console by console
R1#CONF T
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#Router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 10.1.0.0 0.0.3.255 area 5
R1(config-router)#network 10.113.12.0 0.0.0.255 area 5
R1(config-router)#exit
R1(config)#exit
R1#
*Oct 17 15:46:43.559: %SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]:
Building configuration...
[OK]
R1#
```

Configuración R2

```
configure terminal
no ip domain-lookup
line con 0
logging synchronous
exec-timeout 0 0
exit
interface loopback 2
interface serial 1/0
ip address 10.113.12.1 255.255.255.0
no shutdown
interface serial 1/1
ip address 10.113.13.2 255.255.255.0
no shutdown
exit
```

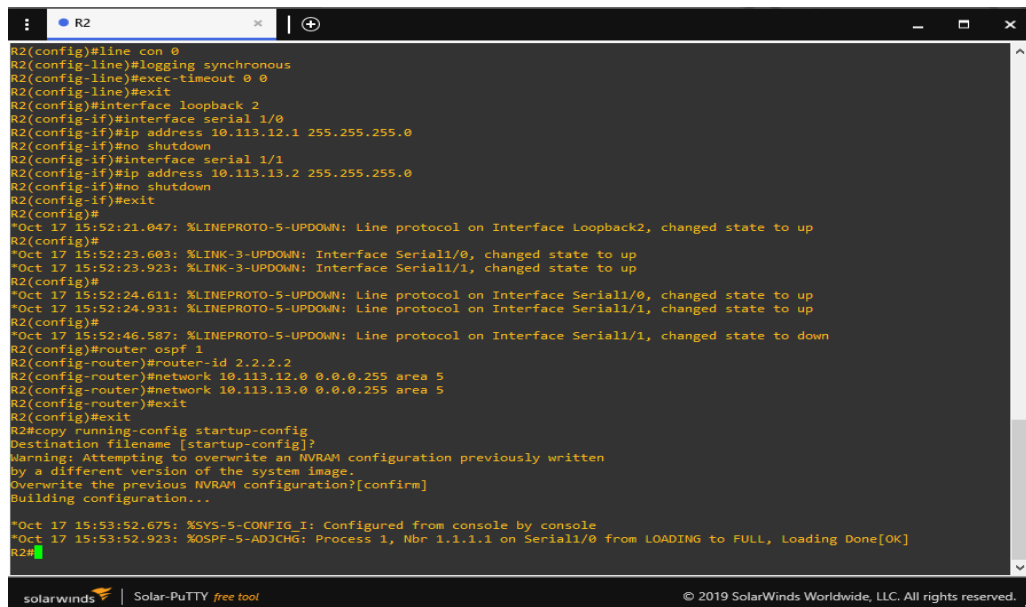
Figura 5. Configuración 1.1 Router 2



```
inistratively down
*Oct 17 15:44:59.003: %LINK-5-CHANGED: Interface Serial1/2, changed state to adm
inistratively down
*Oct 17 15:44:59.043: %LINK-5-CHANGED: Interface Serial1/3, changed state to adm
inistratively down
*Oct 17 15:44:59.951: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0,
changed state to down
*Oct 17 15:44:59.995: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1,
changed state to down
*Oct 17 15:45:00.003: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2,
changed state to down
*Oct 17 15:45:00.043: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3,
changed state to down
R2#
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#no ip domain-lookup
R2(config)#line con 0
R2(config-line)#logging synchronous
R2(config-line)#exec-timeout 0 0
R2(config-line)#exit
R2(config)#interface loopback 2
R2(config-if)#interface serial 1/0
R2(config-if)#ip address 10.113.12.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#interface serial 1/1
R2(config-if)#ip address 10.113.13.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Oct 17 15:52:21.047: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback2, changed state to up
R2(config)#
*Oct 17 15:52:23.603: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
*Oct 17 15:52:23.923: %LINK-3-UPDOWN: Interface Serial1/1, changed state to up
R2(config)#
*Oct 17 15:52:24.611: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
*Oct 17 15:52:24.931: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
R2(config)#
```

```
router ospf 1
router-id 2.2.2.2
network 10.113.12.0 0.0.0.255 area 5
network 10.113.13.0 0.0.0.255 area 5
exit
exit
copy running-config startup-config
```

Figura 6. Configuración 1.2 Router 2



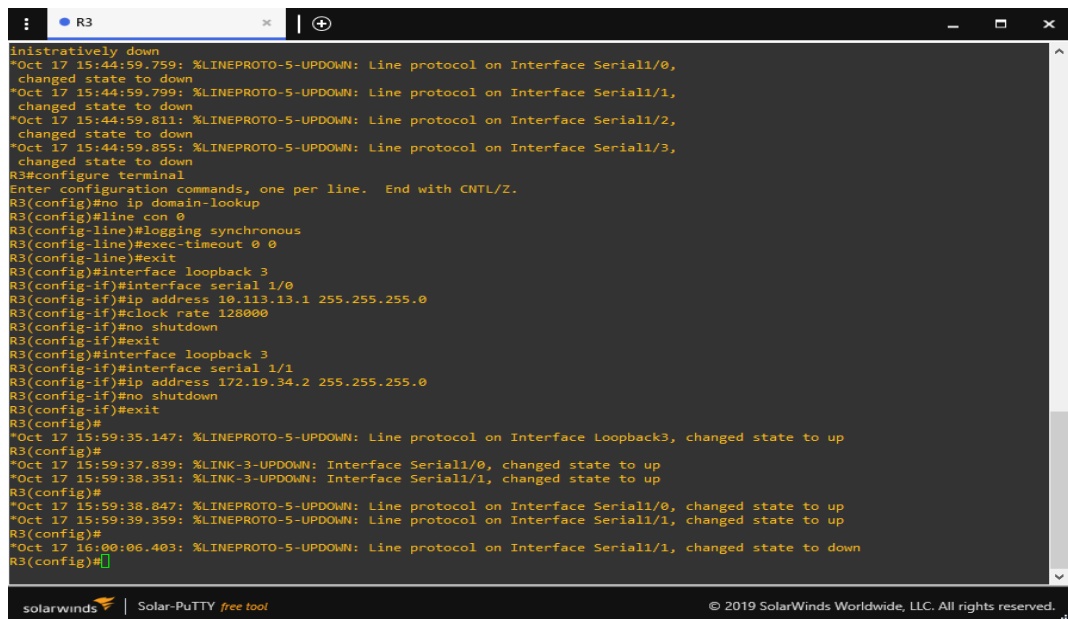
```
R2(config)#line con 0
R2(config-line)#logging synchronous
R2(config-line)#exec-timeout 0 0
R2(config-line)#exit
R2(config)#interface loopback 2
R2(config-if)#interface serial 1/0
R2(config-if)#ip address 10.113.12.1 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#interface serial 1/1
R2(config-if)#ip address 10.113.13.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#
*Oct 17 15:52:21.047: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback2, changed state to up
R2(config)#
*Oct 17 15:52:23.603: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
*Oct 17 15:52:23.923: %LINK-3-UPDOWN: Interface Serial1/1, changed state to up
R2(config)#
*Oct 17 15:52:24.611: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
*Oct 17 15:52:24.931: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
R2(config)#
*Oct 17 15:52:46.587: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
R2(config)#router ospf 1
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network 10.113.12.0 0.0.0.255 area 5
R2(config-router)#network 10.113.13.0 0.0.0.255 area 5
R2(config-router)#exit
R2(config)#exit
R2#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...

*Oct 17 15:53:52.675: %SYS-5-CONFIG_I: Configured from console by console
*Oct 17 15:53:52.923: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial1/0 from LOADING to FULL, Loading Done[OK]
R2#
```

Configuración R3

```
configure terminal
no ip domain-lookup
line con 0
logging synchronous
exec-timeout 0 0
exit
interface loopback 3
interface serial 1/0
ip address 10.113.13.1 255.255.255.0
clock rate 128000
no shutdown
exit
interface loopback 3
interface serial 1/1
ip address 172.19.34.2 255.255.255.0
no shutdown
exit
```

Figura 7. Configuración 1.1 Router 3



```
R3
ministratively down
*Oct 17 15:44:59.759: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0,
changed state to down
*Oct 17 15:44:59.799: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1,
changed state to down
*Oct 17 15:44:59.811: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/2,
changed state to down
*Oct 17 15:44:59.855: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3,
changed state to down
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#no ip domain-lookup
R3(config)#line con 0
R3(config-line)#logging synchronous
R3(config-line)#exec-timeout 0 0
R3(config-line)#exit
R3(config)#interface loopback 3
R3(config-if)#interface serial 1/0
R3(config-if)#ip address 10.113.13.1 255.255.255.0
R3(config-if)#clock rate 128000
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#interface loopback 3
R3(config-if)#interface serial 1/1
R3(config-if)#ip address 172.19.34.2 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#
*Oct 17 15:59:35.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback3, changed state to up
R3(config)#
*Oct 17 15:59:37.839: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
*Oct 17 15:59:38.351: %LINK-3-UPDOWN: Interface Serial1/1, changed state to up
R3(config)#
*Oct 17 15:59:38.847: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
*Oct 17 15:59:39.359: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
R3(config)#
*Oct 17 16:00:06.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
R3(config)#
```

```
router ospf 1
router-id 3.3.3.3
network 10.113.13.0 0.0.0.255 area 5
exit
exit
copy running-config startup-config
```

Figura 8. Configuración 1.2 Router 3

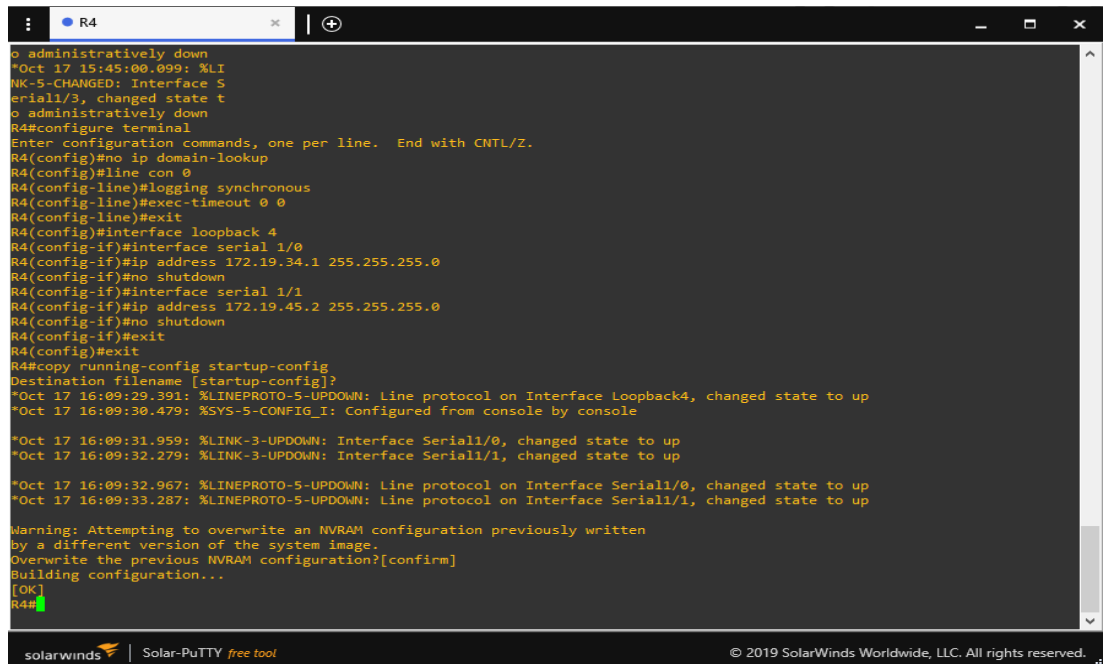
```
R3(config-line)#exec-timeout 0 0
R3(config-line)#exit
R3(config)#interface loopback 3
R3(config-if)#interface serial 1/0
R3(config-if)#ip address 10.113.13.1 255.255.255.0
R3(config-if)#clock rate 128000
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#interface loopback 3
R3(config-if)#interface serial 1/1
R3(config-if)#ip address 172.19.34.2 255.255.255.0
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#
*Oct 17 15:59:35.147: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback3, changed state to up
R3(config)#
*Oct 17 15:59:37.839: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
*Oct 17 15:59:38.351: %LINK-3-UPDOWN: Interface Serial1/1, changed state to up
R3(config)#
*Oct 17 15:59:38.847: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
*Oct 17 15:59:39.359: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
R3(config)#
*Oct 17 16:00:06.403: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to down
R3(config)#router ospf 1
R3(config-router)#router-id 3.3.3.3
R3(config-router)#network 10.113.13.0 0.0.0.255 area 5
R3(config-router)#exit
R3(config)#exit
R3#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...

*Oct 17 16:03:41.695: %SYS-5-CONFIG I: Configured from console by console
*Oct 17 16:03:41.943: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial1/0 from LOADING to FULL, Loading Done[OK]
R3#
```

Configuración R4

```
configure terminal
no ip domain-lookup
line con 0
logging synchronous
exec-timeout 0 0
exit
interface loopback 4
interface serial 1/0
ip address 172.19.34.1 255.255.255.0
no shutdown
interface serial 1/1
ip address 172.19.45.2 255.255.255.0
no shutdown
exit
exit
copy running-config startup-config
```

Figura 9. Configuración 1.1 Router 4



```
R4
o administratively down
*Oct 17 15:45:00.099: %LI
NK-5-CHANGED: Interface 5
erial1/3, changed state t
o administratively down
R4#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#no ip domain-lookup
R4(config)#line con 0
R4(config-line)#logging synchronous
R4(config-line)#exec-timeout 0 0
R4(config-line)#exit
R4(config)#interface loopback 4
R4(config-if)#interface serial 1/0
R4(config-if)#ip address 172.19.34.1 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#interface serial 1/1
R4(config-if)#ip address 172.19.45.2 255.255.255.0
R4(config-if)#no shutdown
R4(config-if)#exit
R4(config)#exit
R4#copy running-config startup-config
Destination filename [startup-config]?
*Oct 17 16:09:29.391: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up
*Oct 17 16:09:30.479: %SYS-5-CONFIG_I: Configured from console by console

*Oct 17 16:09:31.959: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
*Oct 17 16:09:32.279: %LINK-3-UPDOWN: Interface Serial1/1, changed state to up

*Oct 17 16:09:32.967: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
*Oct 17 16:09:33.287: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up

Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R4#
```

Configuración R5

```
configure terminal
no ip domain-lookup
line con 0
logging synchronous
exec-timeout 0 0
exit
interface loopback 5
interface serial 1/0
ip address 172.19.45.1 255.255.255.0
clock rate 128000
no shutdown
exit
exit
copy running-config startup-config
```

Figura 10. Configuración 1.1 Router 5

```

to administratively down
*Oct 17 15:45:14.455: %LINK-5-CHANGED: Interface Serial1/0, changed state to adm
inistratively down
*Oct 17 15:45:14.459: %LINK-5-CHANGED: Interface Serial1/1, changed state to adm
inistratively down
*Oct 17 15:45:14.463: %LINK-5-CHANGED: Interface Serial1/2, changed state to adm
inistratively down
*Oct 17 15:45:14.535: %LINK-5-CHANGED: Interface Serial1/3, changed state to adm
inistratively down
R5#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R5(config)#no ip domain-lookup
R5(config)#line con 0
R5(config-line)#logging synchronous
R5(config-line)#exec-timeout 0 0
R5(config-line)#exit
R5(config)#interface loopback 5
R5(config-if)#interface serial 1/0
R5(config-if)#ip address 172.19.45.1 255.255.255.0
R5(config-if)#clock rate 128000
R5(config-if)#no shutdown
R5(config-if)#exit
R5(config)#exit
R5#copy running-config startup-con
*Oct 17 16:14:09.123: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed state to upfig
Destination filename [startup-config]?
*Oct 17 16:14:09.995: %SYS-5-CONFIG_I: Configured from console by console

*Oct 17 16:14:11.783: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up

*Oct 17 16:14:12.791: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up

Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
R5#

```

En este punto se realizó la parametrización inicial de los routers de acuerdo con lo solicitado, se asignaron las diferentes direcciones con respecto a las referencias de la tabla 1 interfaces routers; como resultado se obtiene el nombre y la dirección con la que se reconoce cada uno de los Router.

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.

Tabla 2. Interfaces Loopback R1

Loopback	Dirección IP
Loopback11	10.1.0.1/22
Loopback12	10.1.4.1/22
Loopback13	10.1.8.1/22
Loopback14	10.1.12.1/22

Configuración R1

```

configure terminal
interface loopback11
ip address 10.1.0.1 255.255.252.0
exit
interface loopback12
ip address 10.1.4.1 255.255.252.0
exit

```

```

interface loopback13
ip address 10.1.8.1 255.255.252.0
exit
interface loopback14
ip address 10.1.12.1 255.255.252.0
exit
router ospf 1
router-id 1.1.1.1
network 10.1.0.0 0.0.3.255 area 5
network 10.113.12.0
exit
router ospf 1
network 10.113.12.0 0.0.0.255 area 5
exit
exit
copy running-config startup-config

```

Figura 11. Configuración 2.1 Router 1

```

R1
*Oct 17 15:53:52.947: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial1/0 from L
LOADING to FULL, Loading Done
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface loopback11
R1(config-if)#ip address 10.1.0.1 255.255.252.0
R1(config-if)#exit
R1(config)#interface loopback12
R1(config-if)#ip address 10.1.4.1 255.255.252.0
R1(config-if)#exit
R1(config)#interface loopback13
R1(config-if)#ip address 10.1.8.1 255.255.252.0
R1(config-if)#exit
R1(config)#interface loopback14
R1(config-if)#ip address 10.1.12.1 255.255.252.0
R1(config-if)#exit
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 10.1.0.0 0.0.3.255 area 5
R1(config-router)#
*Oct 17 16:24:08.763: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback11, changed state to up
*Oct 17 16:24:09.131: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback12, changed state to up
*Oct 17 16:24:09.387: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback13, changed state to up
*Oct 17 16:24:09.647: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback14, changed state to up
network 10.113.12.0
% Incomplete command.
R1(config-router)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.113.12.0 0.0.0.255 area 5
R1(config-router)#exit
R1(config)#exit
R1#
*Oct 17 16:24:42.959: %SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#

```

```

configure terminal
interface loopback11
ip ospf network point-to-point
exit
interface loopback12
ip ospf network point-to-point
exit
interface loopback13
ip ospf network point-to-point
exit
interface loopback14

```

```

ip ospf network point-to-point
exit
exit
copy running-config startup-config

```

Figura 12. Configuración 2.2 Router 1

```

*Oct 17 16:24:09.131: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback12, changed state to up
*Oct 17 16:24:09.387: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback13, changed state to up
*Oct 17 16:24:09.647: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback14, changed state to upnetwork 10.113.12.0
% Incomplete command.

R1(config-router)#exit
R1(config)#router ospf 1
R1(config-router)#network 10.113.12.0 0.0.0.255 area 5
R1(config-router)#exit
R1(config)#exit
R1#
*Oct 17 16:24:42.959: %SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface loopback11
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exit
R1(config)#interface loopback12
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exit
R1(config)#interface loopback13
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exit
R1(config)#interface loopback14
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exit
R1(config)#exit
R1#
*Oct 17 16:27:45.267: %SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#

```

De acuerdo con el desarrollo anterior, se evidencia que se realizó configuración del Router 1 en el cual se configuro las cuatro (4) interfaces loopback a los cuales se les asigno la dirección IP correspondiente.

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.

Tabla 3. Interfaces Loopback R5

Loopback	Dirección IP
Loopback51	172.5.0.1
Loopback52	172.5.4.1
Loopback53	172.5.8.1
Loopback54	172.5.12.1

Configuración R5

```

configure terminal
interface loopback51
ip address 172.5.0.1 255.255.252.0
exit
interface loopback52
ip address 172.5.4.1 255.255.252.0

```

```

exit
interface loopback53
ip address 172.5.8.1 255.255.252.0
exit
interface loopback54
ip address 172.5.12.1 255.255.252.0
exit
router eigrp 15
auto-summary
network 172.5.0.0 0.0.3.255
network 172.19.45.0 0.0.0.255
exit
exit
copy running-config startup-config

```

Figura 13. Configuración 3.1 Router 5

```

R5
Virtual Private Dialup Network
Vpdn-group          VPDN group configuration
Vpdn-template       vpdn-template configuration
vrf                 VRF commands
vrrs                vrrs global command
vty-async           Enable Virtual async line configuration
warm-reboot        Warm reboot allows quick reload in case of a
                   crash or by request
wsma                Configure Web Services Management Agents
x25                 X.25 Level 3
x29                 X.29 commands
xconnect            Xconnect config commands

R5(config)#router eigrp 15
R5(config-router)#exit
R5(config)#exit
R5#
*Oct 17 16:34:07.751: %SYS-5-CONFIG_I: Configured from console by console
R5#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R5(config)#interface loopback51
R5(config-if)#ip address 172.5.0.1 255.255.252.0
R5(config-if)#exit
R5(config)#interface loopback52
R5(config-if)#ip address 172.5.4.1 255.255.252.0
R5(config-if)#exit
R5(config)#interface loopback53
R5(config-if)#ip address 172.5.8.1 255.255.252.0
R5(config-if)#exit
R5(config)#interface loopback54
R5(config-if)#ip address 172.5.12.1 255.255.252.0
R5(config-if)#exit
R5(config)#router eigrp 15
R5(config-router)#auto-summary
R5(config-router)#network 172.5.0.0 0.0.3.255
R5(config-router)#network 172.19.45.0 0.0.0.255
R5(config-router)#exit
R5(config)#

```

En este punto y siguiendo las instrucciones, se realizó la configuración del Router 5 en donde se realizó el procedimiento de configuración de las cuatro (4) interfaces Loopback, para obtener la configuración respectiva acorde con la red.

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**.

Figura 14. Revisión 4.1 de interfaces en Router 3



```
R3(config-router)#router-id 3.3.3.3
R3(config-router)#network 10.113.13.0 0.0.0.255 area 5
R3(config-router)#exit
R3(config)#exit
R3#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...

*Oct 17 16:03:41.695: %SYS-5-CONFIG_I: Configured from console by console
*Oct 17 16:03:41.943: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial1/0 from L
OADING to FULL, Loading Done[OK]
R3#
*Oct 17 16:09:46.447: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1,
changed state to up
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
I - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
O    10.1.0.0/22 [110/129] via 10.113.13.2, 00:08:41, Serial1/0
O    10.113.12.0/24 [110/128] via 10.113.13.2, 00:32:44, Serial1/0
C    10.113.13.0/24 is directly connected, Serial1/0
L    10.113.13.1/32 is directly connected, Serial1/0
C    172.19.0.0/16 is variably subnetted, 2 subnets, 2 masks
C    172.19.34.0/24 is directly connected, Serial1/1
L    172.19.34.2/32 is directly connected, Serial1/1
R3#
```

En esta parte del ejercicio se realizó el comando Show ip route, sobre esto en la figura 14 se observa que el Router está aprendiendo las direcciones de las interfaces loopback.

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.

Configuración R3

```
configure terminal
router ospf 15
redistribute eigrp 15 subnets
exit
router ospf 1
redistribute eigrp 15
redistribute eigrp 15 subnets
exit
router eigrp 15
redistribute ospf 1 metric 1544 100 255 1 1500
exit
exit
```

Figura 15. Configuración 5.1 Router 3

```
R3
*Oct 17 16:09:46.447: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1,
changed state to up
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
       I - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

 10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
O   10.1.0.0/22 [110/129] via 10.113.13.2, 00:08:41, Serial1/0
O   10.113.12.0/24 [110/128] via 10.113.13.2, 00:32:44, Serial1/0
C   10.113.13.0/24 is directly connected, Serial1/0
L   10.113.13.1/32 is directly connected, Serial1/0
L   172.19.0.0/16 is variably subnetted, 2 subnets, 2 masks
C   172.19.34.0/24 is directly connected, Serial1/1
L   172.19.34.2/32 is directly connected, Serial1/1
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 15
R3(config-router)#redistribute eigrp 15 subnets
R3(config-router)#exit
R3(config)#router ospf 1
R3(config-router)#redistribute eigrp 15
R3(config-router)#redistribute eigrp 15 subnets
R3(config-router)#exit
R3(config)#router eigrp 15
R3(config-router)#redistribute ospf 1 metric 1544 100 255 1 1500
R3(config-router)#exit
R3(config)#exit
R3#
*Oct 17 16:41:35.559: %SYS-5-CONFIG_I: Configured from console by console
R3#
```

Figura 16. Revisión 5.1 de interfaces en Router 3

```
R3
C   172.19.34.0/24 is directly connected, Serial1/1
L   172.19.34.2/32 is directly connected, Serial1/1
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 15
R3(config-router)#redistribute eigrp 15 subnets
R3(config-router)#exit
R3(config)#router ospf 1
R3(config-router)#redistribute eigrp 15
R3(config-router)#redistribute eigrp 15 subnets
R3(config-router)#exit
R3(config)#router eigrp 15
R3(config-router)#redistribute ospf 1 metric 1544 100 255 1 1500
R3(config-router)#exit
R3(config)#exit
R3#
*Oct 17 16:41:35.559: %SYS-5-CONFIG_I: Configured from console by console
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
       I - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

 10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
O   10.1.0.0/22 [110/129] via 10.113.13.2, 00:15:53, Serial1/0
O   10.113.12.0/24 [110/128] via 10.113.13.2, 00:39:56, Serial1/0
C   10.113.13.0/24 is directly connected, Serial1/0
L   10.113.13.1/32 is directly connected, Serial1/0
L   172.19.0.0/16 is variably subnetted, 2 subnets, 2 masks
C   172.19.34.0/24 is directly connected, Serial1/1
L   172.19.34.2/32 is directly connected, Serial1/1
R3#
```

configure terminal
router ospf 1

```

network 172.29.34.0 0.0.0.255 area 5
exit
exit
show ip route

```

Figura 17. Configuración y Revisión 5.2 de interfaces en Router 3

```

R3
10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
O   10.1.0.0/22 [110/129] via 10.113.13.2, 00:15:53, Serial1/0
O   10.113.12.0/24 [110/128] via 10.113.13.2, 00:39:56, Serial1/0
C   10.113.13.0/24 is directly connected, Serial1/0
L   10.113.13.1/32 is directly connected, Serial1/0
L   172.19.0.0/16 is variably subnetted, 2 subnets, 2 masks
C   172.19.34.0/24 is directly connected, Serial1/1
L   172.19.34.2/32 is directly connected, Serial1/1
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#network 172.29.34.0 0.0.0.255 area 5
R3(config-router)#exit
R3(config)#exit
R3#
*Oct 17 16:46:16.023: %SYS-5-CONFIG_I: Configured from console by console
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
i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
O   10.1.0.0/22 [110/129] via 10.113.13.2, 00:18:32, Serial1/0
O   10.113.12.0/24 [110/128] via 10.113.13.2, 00:42:35, Serial1/0
C   10.113.13.0/24 is directly connected, Serial1/0
L   10.113.13.1/32 is directly connected, Serial1/0
L   172.19.0.0/16 is variably subnetted, 2 subnets, 2 masks
C   172.19.34.0/24 is directly connected, Serial1/1
L   172.19.34.2/32 is directly connected, Serial1/1
R3#

```

```

configure terminal
router ospf 1
redistribute eigrp 15 subnets
log-adjacency-changes
redistribute eigrp 7 subnets
network 172.19.45.0 0.0.0.255 area 5
exit
router eigrp 15
redistribute ospf 1 metric 50000 200 255 1 1500
auto-summary
exit
exit
copy running-config startup-config

```

Figura 18. Configuración y Revisión 5.3 de interfaces en Router 3

```
R3
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
i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
+ - replicated route, % - next hop override

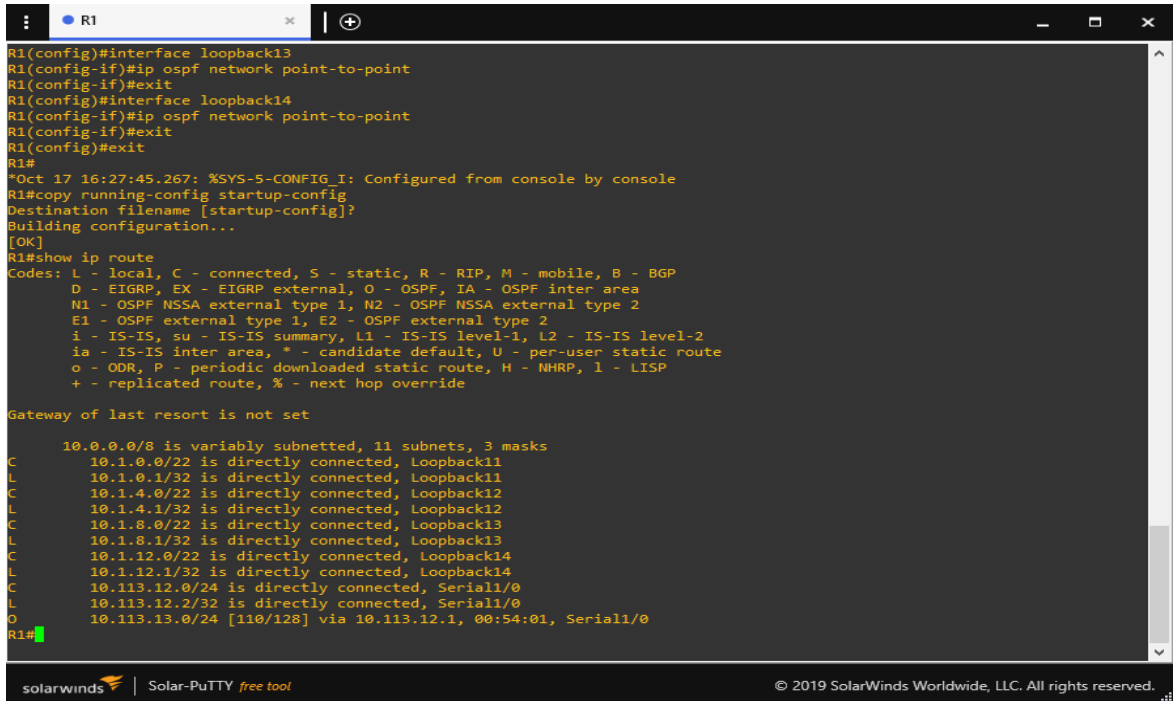
Gateway of last resort is not set

  10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
O   10.1.0.0/22 [110/129] via 10.113.13.2, 00:18:32, Serial1/0
O   10.113.12.0/24 [110/128] via 10.113.13.2, 00:42:35, Serial1/0
C   10.113.13.0/24 is directly connected, Serial1/0
L   10.113.13.1/32 is directly connected, Serial1/0
  172.19.0.0/16 is variably subnetted, 2 subnets, 2 masks
C   172.19.34.0/24 is directly connected, Serial1/1
L   172.19.34.2/32 is directly connected, Serial1/1
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#redistribute eigrp 15 subnets
R3(config-router)#log-adjacency-changes
R3(config-router)#redistribute eigrp 7 subnets
R3(config-router)#network 172.19.45.0 0.0.0.255 area 5
R3(config-router)#exit
R3(config)#router eigrp 15
R3(config-router)#redistribute ospf 1 metric 50000 200 255 1 1500
R3(config-router)#auto-summary
R3(config-router)#exit
R3(config)#exit
R3#
*Oct 17 16:49:18.055: %SYS-5-CONFIG_I: Configured from console by console
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#
```

Se realizó el proceso para la distribución de las rutas encontradas en EIGRP en OSPF en donde se asignó el costo de 50000 y a su vez se trabajó para que las rutas OSPF pasaran a EIGRP; de este modo el Router R3 se distribuye y conecta con cada uno de los routers.

1.6. 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 19. Revisión 6.1 de interfaces en Router 1

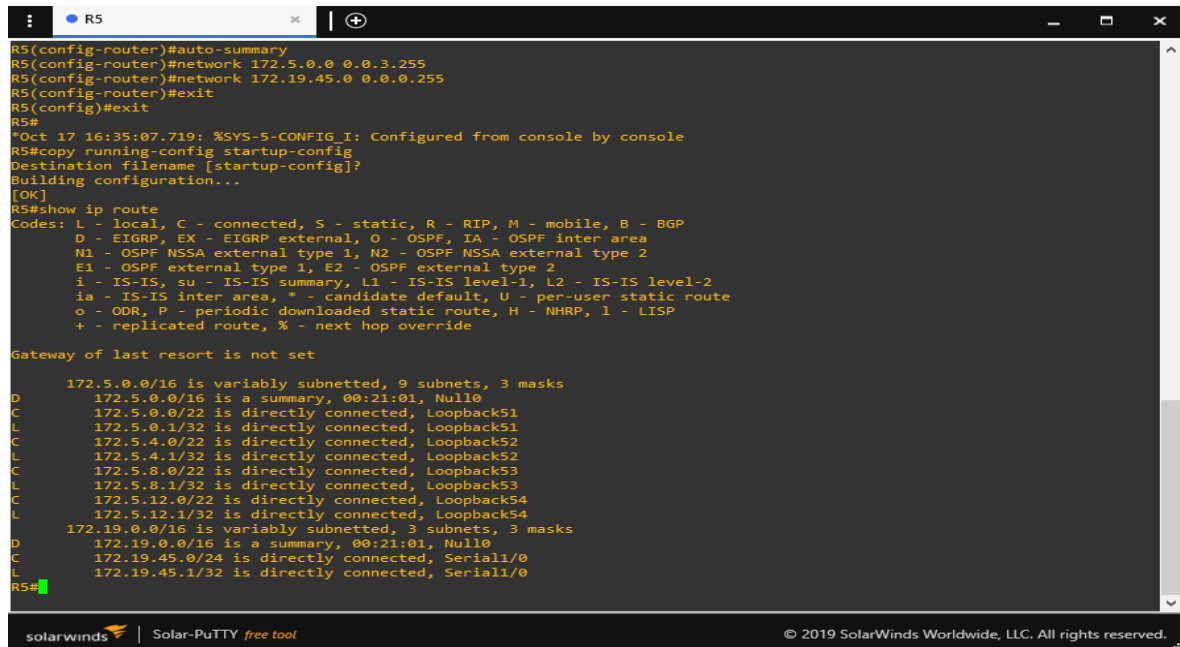


```
R1
R1(config)#interface loopback13
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exit
R1(config)#interface loopback14
R1(config-if)#ip ospf network point-to-point
R1(config-if)#exit
R1(config)#exit
R1#
*Oct 17 16:27:45.267: %SYS-5-CONFIG_I: Configured from console by console
R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
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
       i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       + - replicated route, % - next hop override

Gateway of last resort is not set

 10.0.0.0/8 is variably subnetted, 11 subnets, 3 masks
C    10.1.0.0/22 is directly connected, Loopback11
L    10.1.0.1/32 is directly connected, Loopback11
C    10.1.4.0/22 is directly connected, Loopback12
L    10.1.4.1/32 is directly connected, Loopback12
C    10.1.8.0/22 is directly connected, Loopback13
L    10.1.8.1/32 is directly connected, Loopback13
C    10.1.12.0/22 is directly connected, Loopback14
L    10.1.12.1/32 is directly connected, Loopback14
C    10.113.12.0/24 is directly connected, Serial1/0
L    10.113.12.2/32 is directly connected, Serial1/0
O    10.113.13.0/24 [110/128] via 10.113.12.1, 00:54:01, Serial1/0
R1#
```

Figura 20. Revisión 6.2 de interfaces en Router 5



```
R5
R5(config-router)#auto-summary
R5(config-router)#network 172.5.0.0 0.0.3.255
R5(config-router)#network 172.19.45.0 0.0.0.255
R5(config-router)#exit
R5#
*Oct 17 16:35:07.719: %SYS-5-CONFIG_I: Configured from console by console
R5#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
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
       i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       + - replicated route, % - next hop override

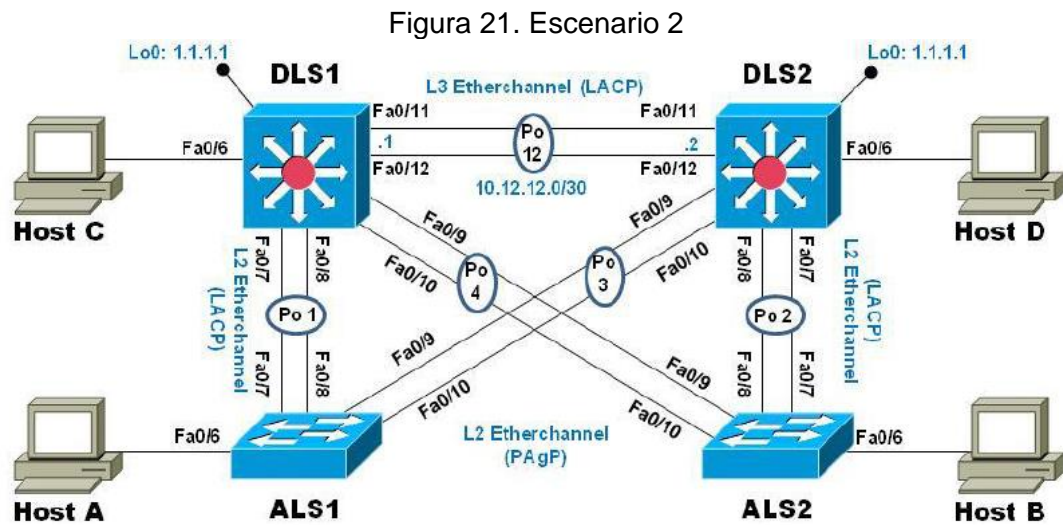
Gateway of last resort is not set

 172.5.0.0/16 is variably subnetted, 9 subnets, 3 masks
D    172.5.0.0/16 is a summary, 00:21:01, Null0
C    172.5.0.0/22 is directly connected, Loopback51
L    172.5.0.1/32 is directly connected, Loopback51
C    172.5.4.0/22 is directly connected, Loopback52
L    172.5.4.1/32 is directly connected, Loopback52
C    172.5.8.0/22 is directly connected, Loopback53
L    172.5.8.1/32 is directly connected, Loopback53
C    172.5.12.0/22 is directly connected, Loopback54
L    172.5.12.1/32 is directly connected, Loopback54
D    172.19.0.0/16 is variably subnetted, 3 subnets, 3 masks
D    172.19.0.0/16 is a summary, 00:21:01, Null0
C    172.19.45.0/24 is directly connected, Serial1/0
L    172.19.45.1/32 is directly connected, Serial1/0
R5#
```

Se realizó la comprobación en los routers 1 y 5, utilizando el comando **show ip route**, allí se observó la existencia de las rutas correspondientes, comprobando la funcionalidad y conexión de la red y su éxito.

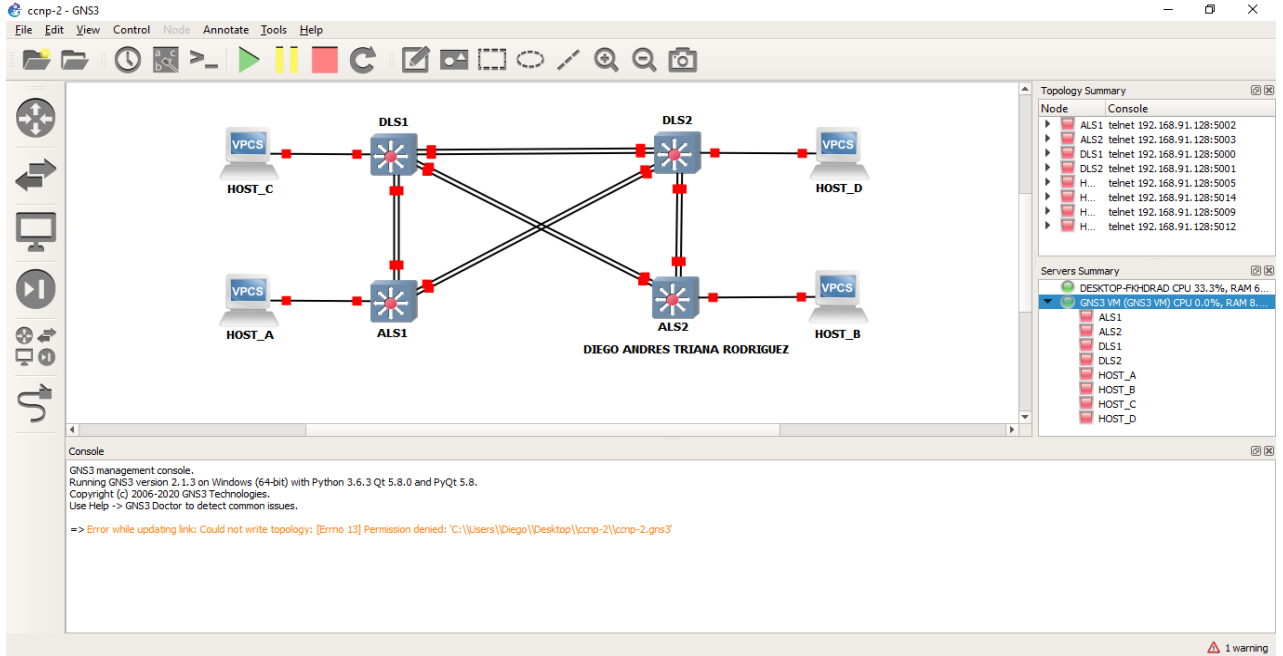
2. ESCENARIO 2

Acorde con el escenario propuesta, se observa la implementación de 4 switches y 4 equipos Host, los cuales se conectan de forma doble entre los dispositivos y cada uno tiene una configuración, cumpliendo con lo exigido lograr una comunicación entre los diferentes elementos de la red.



En la figura 22 se realiza la simulación del escenario por medio del programa GNS3, logrando un escenario real acorde con lo solicitado.

Figura 22. Simulación Escenario 2



En este escenario de simulación se aplicarán las interfaces de la Tabla 4, estas interfaces fueron proporcionadas para el desarrollo del ejercicio y en la misma se evidencia cada interfaz para cada Switch.

Tabla 4. Interfaces Switch

Switch	Interfaz	Dirección IP
DLS1	Ethernet 1/1	10.12.12.1
	Ethernet 1/2	
DLS2	Ethernet 1/1	10.12.12.2
	Ethernet 1/2	
ALS1	serial 1/1	10.113.13.2
ALS2	serial 1/0	10.113.13.1

1. Configurar la red de acuerdo con las especificaciones.

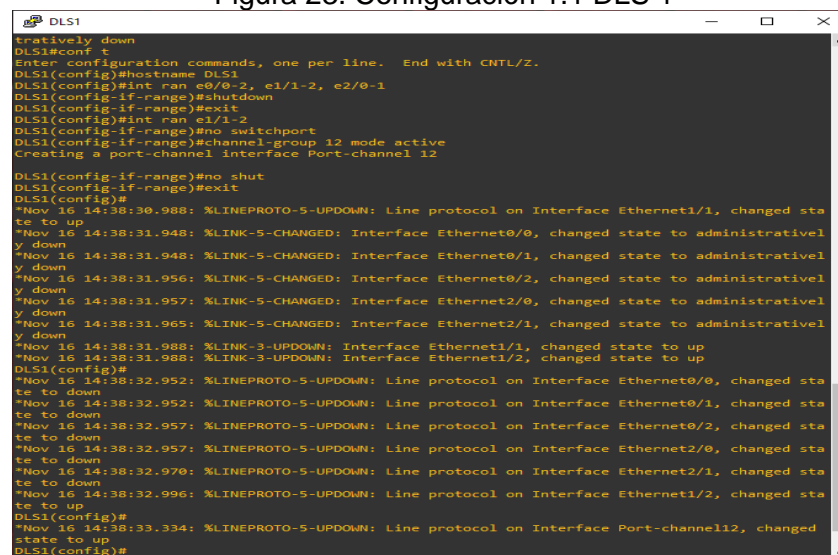
1.1. Apagar todas las interfaces en cada switch.

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

Configuración DLS1

```
conf t
hostname DLS1
int ran e0/0-2, e1/1-2, e2/0-1
shutdown
exit
int ran e1/1-2
no switchport
channel-group 12 mode active
no shut
exit
```

Figura 23. Configuración 1.1 DLS 1



```
DLS1
tratively down
DLS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#hostname DLS1
DLS1(config)#int ran e0/0-2, e1/1-2, e2/0-1
DLS1(config-if-range)#shutdown
DLS1(config-if-range)#exit
DLS1(config)#int ran e1/1-2
DLS1(config-if-range)#no switchport
DLS1(config-if-range)#channel-group 12 mode active
Creating a port-channel interface Port-channel 12
DLS1(config-if-range)#no shut
DLS1(config-if-range)#exit
DLS1(config)#
*Nov 16 14:38:30.988: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to up
*Nov 16 14:38:31.948: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Nov 16 14:38:31.948: %LINK-5-CHANGED: Interface Ethernet0/1, changed state to administratively down
*Nov 16 14:38:31.956: %LINK-5-CHANGED: Interface Ethernet0/2, changed state to administratively down
*Nov 16 14:38:31.957: %LINK-5-CHANGED: Interface Ethernet2/0, changed state to administratively down
*Nov 16 14:38:31.965: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Nov 16 14:38:31.988: %LINK-3-UPDOWN: Interface Ethernet1/1, changed state to up
*Nov 16 14:38:31.988: %LINK-3-UPDOWN: Interface Ethernet1/2, changed state to up
DLS1(config)#
*Nov 16 14:38:32.952: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Nov 16 14:38:32.952: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Nov 16 14:38:32.957: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
*Nov 16 14:38:32.957: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:38:32.970: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Nov 16 14:38:32.996: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up
DLS1(config)#
*Nov 16 14:38:33.334: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed state to up
DLS1(config)#
```

Configuración DLS2

```
conf t
Hostname DLS2
int ran e0/0-2, e1/1-2, e2/0-1
shutdown
exit
int ran e0/1-2
no switchport
channel-group 12 mode active
no shut
exit
```

Figura 24. Configuración 1.1 DLS 2

```
DLS2
tratively down
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#hostname DLS2
DLS2(config)#int ran e0/0-2, e1/1-2, e2/0-1
DLS2(config-if-range)#shutdown
DLS2(config-if-range)#exit
DLS2(config)#int ran e0/1-2
DLS2(config-if-range)#no switchport
DLS2(config-if-range)#channel-group 12 mode active
Creating a port-channel interface Port-channel 12
DLS2(config-if-range)#no shut
DLS2(config-if-range)#exit
DLS2(config)#
*Nov 16 14:46:23.098: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Nov 16 14:46:23.108: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed state to up
*Nov 16 14:46:23.108: %LINK-5-CHANGED: Interface Ethernet1/1, changed state to administratively down
*Nov 16 14:46:23.109: %LINK-5-CHANGED: Interface Ethernet1/2, changed state to administratively down
*Nov 16 14:46:23.109: %LINK-5-CHANGED: Interface Ethernet2/0, changed state to administratively down
*Nov 16 14:46:23.119: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
DLS2(config)#
*Nov 16 14:46:23.132: %LINK-3-UPDOWN: Interface Ethernet0/1, changed state to up
*Nov 16 14:46:23.132: %LINK-3-UPDOWN: Interface Ethernet0/2, changed state to up
*Nov 16 14:46:24.100: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Nov 16 14:46:24.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to down
*Nov 16 14:46:24.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to down
*Nov 16 14:46:24.115: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:46:24.120: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Nov 16 14:46:24.141: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
DLS2(config)#
*Nov 16 14:46:24.141: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
DLS2(config)#
```

Configuración ALS1
conf t
hostname ALS1
int ran e0/0-2, e1/1-2, e2/0-1
shutdown
exit

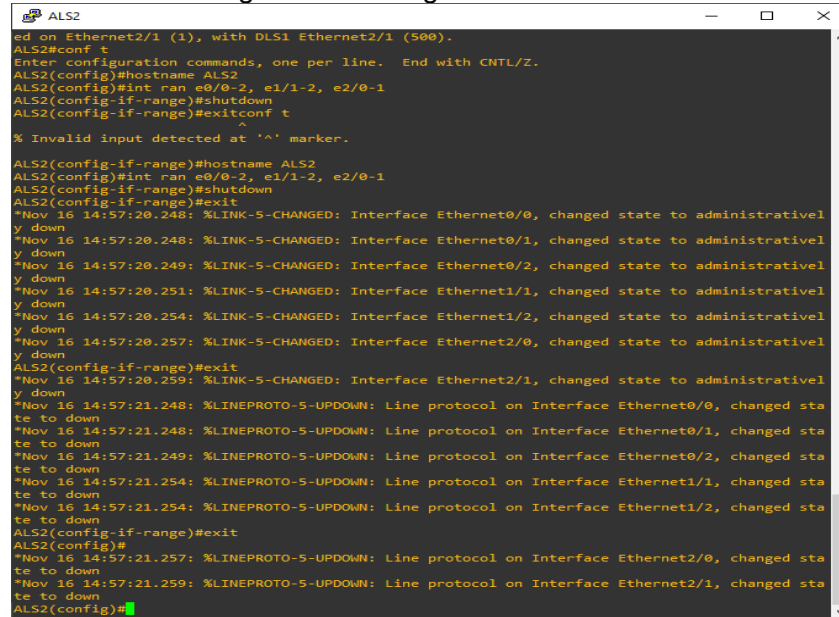
Figura 25. Configuración 1.1 ALS 1

```
ALS1
*Nov 16 14:52:24.335: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/2 (1), with DLS1 Ethernet0/2 (500).
*Nov 16 14:52:24.335: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (1), with DLS1 Ethernet0/1 (500).
*Nov 16 14:53:24.335: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/2 (1), with DLS1 Ethernet0/2 (500).
*Nov 16 14:53:24.335: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (1), with DLS1 Ethernet0/1 (500).
ALS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#hostname ALS1
ALS1(config)#int ran e0/0-2, e1/1-2, e2/0-1
ALS1(config-if-range)#shutdown
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:54:14.363: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Nov 16 14:54:14.370: %LINK-5-CHANGED: Interface Ethernet0/1, changed state to administratively down
*Nov 16 14:54:14.370: %LINK-5-CHANGED: Interface Ethernet0/2, changed state to administratively down
*Nov 16 14:54:14.379: %LINK-5-CHANGED: Interface Ethernet1/1, changed state to administratively down
*Nov 16 14:54:14.379: %LINK-5-CHANGED: Interface Ethernet1/2, changed state to administratively down
*Nov 16 14:54:14.383: %LINK-5-CHANGED: Interface Ethernet2/0, changed state to administratively down
ALS1(config)#
*Nov 16 14:54:14.383: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Nov 16 14:54:15.364: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Nov 16 14:54:15.373: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Nov 16 14:54:15.373: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to down
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to down
ALS1(config)#
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
ALS1(config)#
```

Configuración ALS2

```
conf t
hostname ALS2
int ran e0/0-2, e1/1-2, e2/0-1
shutdown
exit
```

Figura 26. Configuración 1.1 ALS 2



```
ed on Ethernet2/1 (1), with DLS1 Ethernet2/1 (500).
ALS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)#hostname ALS2
ALS2(config)#int ran e0/0-2, e1/1-2, e2/0-1
ALS2(config-if-range)#shutdown
ALS2(config-if-range)#exitconf t
^
% Invalid input detected at '^' marker.

ALS2(config-if-range)#hostname ALS2
ALS2(config-if-range)#int ran e0/0-2, e1/1-2, e2/0-1
ALS2(config-if-range)#shutdown
ALS2(config-if-range)#exit
*Nov 16 14:57:20.248: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Nov 16 14:57:20.248: %LINK-5-CHANGED: Interface Ethernet0/1, changed state to administratively down
*Nov 16 14:57:20.249: %LINK-5-CHANGED: Interface Ethernet0/2, changed state to administratively down
*Nov 16 14:57:20.251: %LINK-5-CHANGED: Interface Ethernet1/1, changed state to administratively down
*Nov 16 14:57:20.254: %LINK-5-CHANGED: Interface Ethernet1/2, changed state to administratively down
*Nov 16 14:57:20.257: %LINK-5-CHANGED: Interface Ethernet2/0, changed state to administratively down
ALS2(config-if-range)#exit
*Nov 16 14:57:20.259: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Nov 16 14:57:21.248: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Nov 16 14:57:21.248: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Nov 16 14:57:21.249: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
*Nov 16 14:57:21.254: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to down
*Nov 16 14:57:21.254: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to down
*Nov 16 14:57:21.257: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:57:21.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:57:21.257: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:57:21.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
ALS2(config)#
```

En este punto se realizó la parametrización inicial de los Switch de acuerdo con lo solicitado, se asignaron las diferentes direcciones con respecto a las referencias de la tabla 4 interfaces Switch; como resultado se obtiene el nombre y la dirección con la que se reconoce cada uno de los Switch en cada uno de los puntos de conexión del diagrama de red.

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

1.3.1. 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.

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

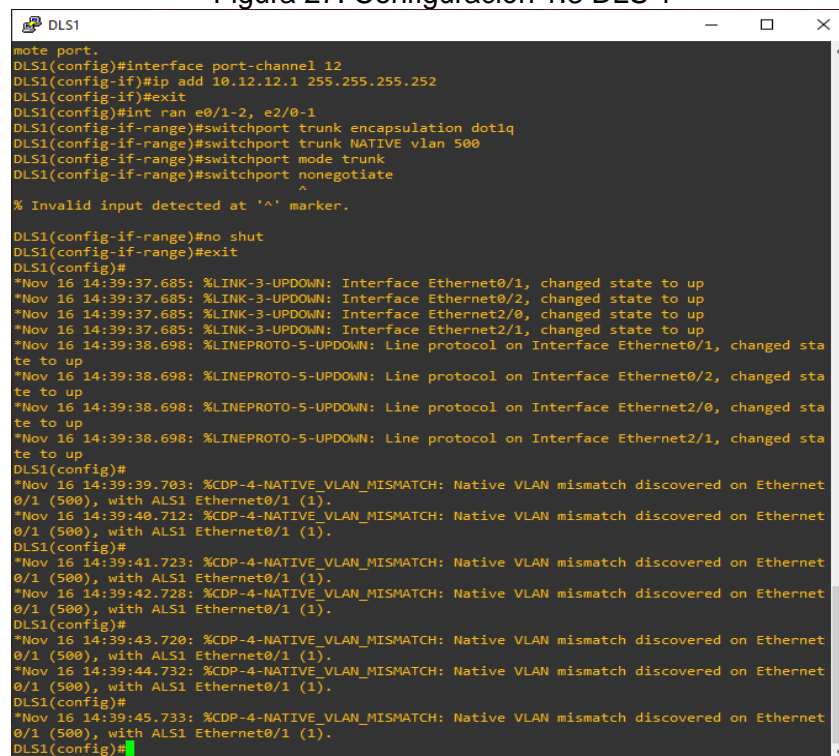
1.3.3. Los Port-channels en las interfaces F0/9 y fa0/10 utilizará PAgP.

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

Configuración DLS1

```
interface port-channel 12
ip add 10.12.12.1 255.255.255.252
exit
int ran e0/1-2, e2/0-1
switchport trunk encapsulation dot1q
switchport trunk NATIVE vlan 500
switchport mode trunk
switchport nonegotiate
no shut
exit
```

Figura 27. Configuración 1.3 DLS 1



```
DLS1
note port.
DLS1(config)#interface port-channel 12
DLS1(config-if)#ip add 10.12.12.1 255.255.255.252
DLS1(config-if)#exit
DLS1(config)#int ran e0/1-2, e2/0-1
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport trunk NATIVE vlan 500
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#switchport nonegotiate
^
% Invalid input detected at '^' marker.

DLS1(config-if-range)#no shut
DLS1(config-if-range)#exit
DLS1(config)#
*Nov 16 14:39:37.685: %LINK-3-UPDOWN: Interface Ethernet0/1, changed state to up
*Nov 16 14:39:37.685: %LINK-3-UPDOWN: Interface Ethernet0/2, changed state to up
*Nov 16 14:39:37.685: %LINK-3-UPDOWN: Interface Ethernet2/0, changed state to up
*Nov 16 14:39:37.685: %LINK-3-UPDOWN: Interface Ethernet2/1, changed state to up
*Nov 16 14:39:38.698: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
*Nov 16 14:39:38.698: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
*Nov 16 14:39:38.698: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
*Nov 16 14:39:38.698: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to up
DLS1(config)#
*Nov 16 14:39:39.703: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
*Nov 16 14:39:40.712: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
DLS1(config)#
*Nov 16 14:39:41.723: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
*Nov 16 14:39:42.728: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
DLS1(config)#
*Nov 16 14:39:43.720: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
*Nov 16 14:39:44.732: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
DLS1(config)#
*Nov 16 14:39:45.733: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/1 (500), with ALS1 Ethernet0/1 (1).
DLS1(config)#
```

Configuración DLS2

```
interface port-channel 12
ip address 10.12.12.2 255.255.255.252
exit
int ran E0/1-2, E2/0-1
switchport trunk encapsulation dot1q
switchport trunk NATIVE vlan 500
switchport mode trunk
switchport nonegotiate
no shut
exit
int ran E0/1-2
channel-group 2 mode active
exit
```

Figura 28. Configuración 1.3 DLS 2

```
DLS2
te to down
*Nov 16 14:46:24.141: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to up
DLS2(config)#
*Nov 16 14:46:24.141: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed sta
te to up
DLS2(config)#
*Nov 16 14:46:29.383: %EC-5-L3DONTBNDL2: Et0/1 suspended: LACP currently not enabled on the re
mote port.
*Nov 16 14:46:29.817: %EC-5-L3DONTBNDL2: Et0/2 suspended: LACP currently not enabled on the re
mote port.
DLS2(config)#interface port-channel 12
DLS2(config-if)#ip address 10.12.12.2 255.255.255.252
DLS2(config-if)#exit
DLS2(config)#int ran E0/1-2, E2/0-1
DLS2(config-if-range)#switchport trunk encapsulation dot1q
Command rejected: Et0/1 not a switching port.
% Range command terminated because it failed on Ethernet0/1
DLS2(config-if-range)#switchport trunk NATIVE vlan 500
Command rejected: Et0/1 not a switching port.
% Range command terminated because it failed on Ethernet0/1
DLS2(config-if-range)#switchport mode trunk
Command rejected: Et0/1 not a switching port.
% Range command terminated because it failed on Ethernet0/1
DLS2(config-if-range)#switchport nonegotiate
^
% Invalid input detected at '^' marker.
DLS2(config-if-range)#no shut
DLS2(config-if-range)#exit
DLS2(config)#
*Nov 16 14:46:51.251: %LINK-3-UPDOWN: Interface Ethernet2/0, changed state to up
*Nov 16 14:46:51.252: %LINK-3-UPDOWN: Interface Ethernet2/1, changed state to up
*Nov 16 14:46:52.251: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed sta
te to up
*Nov 16 14:46:52.261: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed sta
te to up
DLS2(config)#int ran E0/1-2
DLS2(config-if-range)#channel-group 2 mode active
Creating a port-channel interface Port-channel 2
DLS2(config-if-range)#exit
DLS2(config)#
*Nov 16 14:47:07.029: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed s
tate to up
DLS2(config)#
```

Configuración ALS1

```
int ran E0/1-2, E2/0-1
swi mo tru
swi tr nat v 500
swi non
no shut
exit
int ran E0/1-2
channel-group 1 mode active
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit
int ran E2/0-1
channel-group 3 mode desirable
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit
```

Figura 29. Configuración 1.3.1 ALS 1

```

ALS1
y down
ALS1(config)#
*Nov 16 14:54:14.383: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Nov 16 14:54:15.364: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Nov 16 14:54:15.373: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Nov 16 14:54:15.373: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to down
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to down
ALS1(config)#
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:54:15.386: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
ALS1(config)#int ran E0/1-2, E2/0-1
ALS1(config-if-range)#swi mo tru
Command rejected: An interface whose trunk encapsulation is "Auto" can not be configured to "trunk" mode.
% Range command terminated because it failed on Ethernet0/1
ALS1(config-if-range)#swi tr nat v 500
ALS1(config-if-range)#swi non
ALS1(config-if-range)#swi non
% Invalid input detected at '^' marker.
ALS1(config-if-range)#no shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:54:29.661: %LINK-3-UPDOWN: Interface Ethernet0/1, changed state to up
*Nov 16 14:54:29.672: %LINK-3-UPDOWN: Interface Ethernet2/0, changed state to up
*Nov 16 14:54:29.673: %LINK-3-UPDOWN: Interface Ethernet2/1, changed state to up
*Nov 16 14:54:30.683: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
*Nov 16 14:54:30.683: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to up
ALS1(config)#
*Nov 16 14:54:31.683: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
*Nov 16 14:54:31.683: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
ALS1(config)#

```

Figura 30. Configuración 1.3.2 ALS 1

```

ALS1
te to down
*Nov 16 14:54:39.787: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
ALS1(config)#
*Nov 16 14:54:42.797: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
*Nov 16 14:54:42.798: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
ALS1(config)#int ran E0/1-2
ALS1(config-if-range)#channel-group 1 mode active
Creating a port-channel interface Port-channel 1
ALS1(config-if-range)#$trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS1(config-if-range)#no shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:54:49.938: %EC-5-CANNOT_BUNDLE2: Et0/1 is not compatible with Et0/2 and will be suspended (vlan mask is different)
*Nov 16 14:54:49.938: %EC-5-CANNOT_BUNDLE2: Et0/1 is not compatible with Et0/2 and will be suspended (vlan mask is different)
*Nov 16 14:54:49.938: %EC-5-COMPATIBLE: Et0/1 is compatible with port-channel members
ALS1(config)#
*Nov 16 14:54:55.114: %EC-5-L3DONTBNL2: Et0/2 suspended: LACP currently not enabled on the remote port.
ALS1(config)#
*Nov 16 14:54:56.621: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to up
ALS1(config)#int ran E2/0-1
ALS1(config-if-range)#channel-group 3 mode desirable
Creating a port-channel interface Port-channel 3
ALS1(config-if-range)#$trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS1(config-if-range)#no shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:55:00.847: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Et2/1 and will be suspended (vlan mask is different)
*Nov 16 14:55:00.848: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Et2/1 and will be suspended (vlan mask is different)
*Nov 16 14:55:00.848: %EC-5-COMPATIBLE: Et2/0 is compatible with port-channel members
ALS1(config)#
*Nov 16 14:55:01.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:55:01.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
ALS1(config)#

```

Configuración ALS2

```

int ran E2/0-1, E0/1-2
swi mo tru
swi tr nat v 500
swi non
no shut
exit
int ran E0/1-2
channel-group 2 mode active

```

```

switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit
int ran E2/0-1
channel-group 4 mode desirable
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit

```

Figura 31. Configuración 1.3.1 ALS 2

```

ALS2
*Nov 16 14:57:21.254: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed sta
te to down
*Nov 16 14:57:21.254: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed sta
te to down
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:57:21.257: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed sta
te to down
*Nov 16 14:57:21.259: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed sta
te to down
ALS2(config)#int ran E2/0-1, E0/1-2
ALS2(config-if-range)#swi mo tru
Command rejected: An interface whose trunk encapsulation is "Auto" can not be configured to "t
runk" mode.
% Range command terminated because it failed on Ethernet2/0
ALS2(config-if-range)#swi tr nat v 500
ALS2(config-if-range)#swi non
ALS2(config-if-range)#
^
% Invalid input detected at '^' marker.
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:57:42.757: %LINK-3-UPDOWN: Interface Ethernet2/0, changed state to up
*Nov 16 14:57:42.757: %LINK-3-UPDOWN: Interface Ethernet2/1, changed state to up
*Nov 16 14:57:42.757: %LINK-3-UPDOWN: Interface Ethernet0/1, changed state to up
*Nov 16 14:57:42.757: %LINK-3-UPDOWN: Interface Ethernet0/2, changed state to up
*Nov 16 14:57:43.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed sta
te to up
*Nov 16 14:57:43.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed sta
te to up
ALS2(config)#
*Nov 16 14:57:44.287: %SPANTREE-7-RECV_IQ_NON_TRUNK: Received 802.1Q BPDU on non trunk Etherne
t2/0 VLAN1.
*Nov 16 14:57:44.287: %SPANTREE-7-BLOCK_PORT_TYPE: Blocking Ethernet2/0 on VLAN0001. Inconsist
ent port type.
*Nov 16 14:57:44.287: %SPANTREE-7-RECV_IQ_NON_TRUNK: Received 802.1Q BPDU on non trunk Etherne
t2/1 VLAN1.
*Nov 16 14:57:44.287: %SPANTREE-7-BLOCK_PORT_TYPE: Blocking Ethernet2/1 on VLAN0001. Inconsist
ent port type.
ALS2(config)#
*Nov 16 14:57:44.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to up
*Nov 16 14:57:44.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed sta
te to up
ALS2(config)#

```

Figura 32. Configuración 1.3.2 ALS 2

```

ALS2
*Nov 16 14:57:43.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed sta
te to up
*Nov 16 14:57:43.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed sta
te to up
ALS2(config)#
*Nov 16 14:57:44.287: %SPANTREE-7-RECV_IQ_NON_TRUNK: Received 802.1Q BPDU on non trunk Etherne
t2/0 VLAN1.
*Nov 16 14:57:44.287: %SPANTREE-7-BLOCK_PORT_TYPE: Blocking Ethernet2/0 on VLAN0001. Inconsist
ent port type.
*Nov 16 14:57:44.287: %SPANTREE-7-RECV_IQ_NON_TRUNK: Received 802.1Q BPDU on non trunk Etherne
t2/1 VLAN1.
*Nov 16 14:57:44.287: %SPANTREE-7-BLOCK_PORT_TYPE: Blocking Ethernet2/1 on VLAN0001. Inconsist
ent port type.
ALS2(config)#
*Nov 16 14:57:44.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to up
*Nov 16 14:57:44.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed sta
te to up
ALS2(config)#int ran E0/1-2
ALS2(config-if-range)#channel-group 2 mode active
Creating a port-channel interface Port-channel 2
ALS2(config-if-range)#$trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:58:02.884: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to down
*Nov 16 14:58:02.885: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed sta
te to down
ALS2(config)#int ran E2/0-1
ALS2(config-if-range)#channel-group 4 mode desirable
Creating a port-channel interface Port-channel 4
ALS2(config-if-range)#$trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:58:10.032: %EC-5-L3DONTBNDL2: Et0/1 suspended: LACP currently not enabled on the re
mote port.
*Nov 16 14:58:10.342: %EC-5-L3DONTBNDL2: Et0/2 suspended: LACP currently not enabled on the re
mote port.
ALS2(config)#
*Nov 16 14:58:11.933: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to up
ALS2(config)#

```

Figura 33. Configuración 1.3.3 ALS 2

```
ALS2
ALS2(config-if-range)#$trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:58:02.884: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Nov 16 14:58:02.885: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
ALS2(config)#int ran E2/0-1
ALS2(config-if-range)#channel-group 4 mode desirable
Creating a port-channel interface Port-channel 4
ALS2(config-if-range)#$trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
```

Se realizó la correcta configuración de los puertos troncales y de los Port-channels, conectando el DLS1 y DLS2, a los que se les asignó dirección que permitiera su comunicación, se ejecutó el protocolo LACP y PAgP en las interfaces requeridas. Se creó la VLAN nativa para cada uno de los puertos.

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

1.4.1. Utilizar el nombre de dominio CISCO con la contraseña ccmp321

1.4.2. Configurar DLS1 como servidor principal para las VLAN.

1.4.3. Configurar ALS1 y ALS2 como clientes VTP.

Configuración DLS1

```
vtp domain CISCO
vtp ver 3
vtp password ccmp321
end
vtp primary vlan
```

Figura 34. Configuración 1.4 DLS 1

```
DLS1
te to down
*Nov 16 14:40:01.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:40:01.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
DLS1(config)#
*Nov 16 14:40:07.545: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet 0/2 (500), with ALS1 Ethernet0/2 (1).
*Nov 16 14:40:07.748: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet 2/1 (500), with ALS2 Ethernet2/1 (1).
*Nov 16 14:40:07.748: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet 2/0 (500), with ALS2 Ethernet2/0 (1).
*Nov 16 14:40:08.551: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
DLS1(config)#
*Nov 16 14:40:08.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to up
*Nov 16 14:40:08.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
*Nov 16 14:40:09.280: %EC-5-L3DONTBNL2: Et0/1 suspended: LACP currently not enabled on the remote port.
*Nov 16 14:40:09.291: %EC-5-L3DONTBNL2: Et0/2 suspended: LACP currently not enabled on the remote port.
*Nov 16 14:40:09.714: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
DLS1(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
DLS1(config)#vtp ver 3
DLS1(config)#vtp password ccmp321
Setting device VTP password to ccmp321
DLS1(config)#end
DLS1#
*Nov 16 14:40:23.439: %SYS-5-CONFIG_I: Configured from console by console
DLS1#vtp primary vlan
This system is becoming primary server for feature vlan
No conflicting VTP3 devices found.
Do you want to continue? [confirm]
DLS1#
*Nov 16 14:41:02.367: %SM_VLAN-4-VTP_PRIMARY_SERVER_CHG: aabb.cc00.0100 has become the primary server for the VLAN VTP Feature
DLS1#
*Nov 16 14:41:07.763: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet 2/0 (500), with ALS2 Ethernet2/0 (1).
*Nov 16 14:41:07.764: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet 2/1 (500), with ALS2 Ethernet2/1 (1).
DLS1#
```

Configuración ALS1
vtp domain CISCO
vtp ver 3
vtp mo client
vtp password ccnp321

Figura 35. Configuración 1.4 ALS 1

```
ALS1
*Nov 16 14:54:55.114: %EC-5-L3DONTBNL2: Et0/2 suspended: LACP currently not enabled on the re
mote port.
ALS1(config)#
*Nov 16 14:54:56.621: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed s
tate to up
ALS1(config)#int ran E2/0-1
ALS1(config-if-range)#channel-group 3 mode desirable
Creating a port-channel interface Port-channel 3
ALS1(config-if-range)#trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS1(config-if-range)#no shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:55:00.847: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Et2/1 and will be sus
pended (vlan mask is different)
*Nov 16 14:55:00.848: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Et2/1 and will be sus
pended (vlan mask is different)
*Nov 16 14:55:00.848: %EC-5-COMPATIBLE: Et2/0 is compatible with port-channel members
ALS1(config)#
*Nov 16 14:55:01.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed sta
te to down
*Nov 16 14:55:01.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed sta
te to down
ALS1(config)#
*Nov 16 14:55:11.519: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed sta
te to up
*Nov 16 14:55:11.718: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed sta
te to up
ALS1(config)#int vlan 3456
ALS1(config-if)#ip address 10.34.56.101 255.255.255.0
ALS1(config-if)#no shut
ALS1(config-if)#exit
ALS1(config)#
*Nov 16 14:55:18.037: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan3456, changed state
to down
ALS1(config)#
*Nov 16 14:55:19.028: %LINK-3-UPDOWN: Interface Vlan3456, changed state to down
ALS1(config)#ip default-gateway 10.34.56.254
ALS1(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
ALS1(config)#vtp ver 3
Setting device to VTP Client mode for VLANs.
ALS1(config)#vtp password ccnp321
Setting device VTP password to ccnp321
ALS1(config)#
```

Configuración ALS2
vtp domain CISCO
vtp ver 3
vtp mo client
vtp password ccnp321

Figura 36. Configuración 1.4 ALS 2

```

ALS2
ALS2(config-if-range)#$trunk allowed vian 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:58:02.884: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to down
*Nov 16 14:58:02.885: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed sta
te to down
ALS2(config)#int ran E2/0-1
ALS2(config-if-range)#channel-group 4 mode desirable
Creating a port-channel interface Port-channel 4
ALS2(config-if-range)#$trunk allowed vian 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
*Nov 16 14:58:10.032: %EC-5-L3DONTBNDL2: Et0/1 suspended: LACP currently not enabled on the re
mote port.
*Nov 16 14:58:10.342: %EC-5-L3DONTBNDL2: Et0/2 suspended: LACP currently not enabled on the re
mote port.
ALS2(config)#
*Nov 16 14:58:11.933: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed sta
te to up
ALS2(config)#
*Nov 16 14:58:16.619: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel4, changed s
tate to up
ALS2(config)#int vlan 3456
ALS2(config-if)#ip add 10.34.56.102 255.255.255.0
ALS2(config-if)#no shut
ALS2(config-if)#exit
ALS2(config)#
*Nov 16 14:58:26.294: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed sta
te to up
ALS2(config)#
*Nov 16 14:58:28.409: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan3456, changed state
to down
*Nov 16 14:58:29.411: %LINK-3-UPDOWN: Interface Vlan3456, changed state to down
ALS2(config)#ip default-gateway 10.34.56.254
ALS2(config)#vtp domain CISCO
Changing VTP domain name from NULL to CISCO
ALS2(config)#vtp ver 3
ALS2(config)#vtp mo client
Setting device to VTP Client mode for VLANs.
ALS2(config)#vtp password ccnp321
Setting device VTP password to ccnp321
ALS2(config)#

```

En este punto se puede apreciar la generación del procedimiento VTP versión para cada uno de los switches, generando el dominio CISCO, para los cuales se estableció la contraseña ccnp321.

1.5. Configurar en el servidor principal las siguientes VLAN:

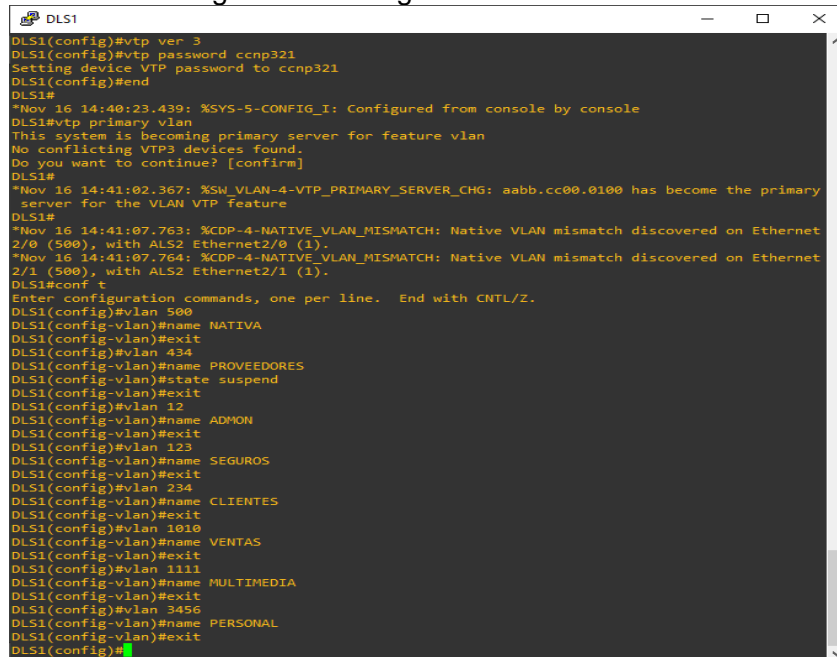
Tabla 5. Numeros de VLAN

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

Configuración DLS1
conf t
vlan 500
name NATIVA
exit
vlan 434
name PROVEEDORES
state suspend
exit
vlan 12

```
name ADMON
exit
vlan 123
name SEGUROS
exit
vlan 234
name CLIENTES
exit
vlan 1010
name VENTAS
exit
vlan 1111
name MULTIMEDIA
exit
vlan 3456
name PERSONAL
exit
```

Figura 37. Configuración 1.5.1 DLS 1



```
DLS1
DLS1(config)#vtp ver 3
DLS1(config)#vtp password ccnp321
Setting device VTP password to ccnp321
DLS1(config)#end
DLS1#
*Nov 16 14:40:23.439: %SYS-5-CONFIG_I: Configured from console by console
DLS1#vtp primary vlan
This system is becoming primary server for feature vlan
No conflicting VTP3 devices found.
Do you want to continue? [confirm]
DLS1#
*Nov 16 14:41:02.367: %SW_VLAN-4-VTP_PRIMARY_SERVER_CHG: aabb.cc00.0100 has become the primary
server for the VLAN VTP Feature
DLS1#
*Nov 16 14:41:07.763: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (500), with ALS2 Ethernet2/0 (1).
*Nov 16 14:41:07.764: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (500), with ALS2 Ethernet2/1 (1).
DLS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS1(config)#vlan 500
DLS1(config-vlan)#name NATIVA
DLS1(config-vlan)#exit
DLS1(config)#vlan 434
DLS1(config-vlan)#name PROVEEDORES
DLS1(config-vlan)#state suspend
DLS1(config-vlan)#exit
DLS1(config)#vlan 12
DLS1(config-vlan)#name ADMON
DLS1(config-vlan)#exit
DLS1(config)#vlan 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#exit
DLS1(config)#vlan 234
DLS1(config-vlan)#name CLIENTES
DLS1(config-vlan)#exit
DLS1(config)#vlan 1010
DLS1(config-vlan)#name VENTAS
DLS1(config-vlan)#exit
DLS1(config)#vlan 1111
DLS1(config-vlan)#name MULTIMEDIA
DLS1(config-vlan)#exit
DLS1(config)#vlan 3456
DLS1(config-vlan)#name PERSONAL
DLS1(config-vlan)#exit
DLS1(config)#
```

Figura 38. Configuración 1.5.2 DLS 1

```
DLS1
DLS1(config)#vlan 434
DLS1(config-vlan)#name PROVEEDORES
DLS1(config-vlan)#state suspend
DLS1(config-vlan)#exit
DLS1(config)#vlan 12
DLS1(config-vlan)#name ADMON
DLS1(config-vlan)#exit
DLS1(config)#vlan 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#exit
DLS1(config)#vlan 234
DLS1(config-vlan)#name CLIENTES
DLS1(config-vlan)#exit
DLS1(config)#vlan 1010
DLS1(config-vlan)#name VENTAS
DLS1(config-vlan)#exit
DLS1(config)#vlan 1111
DLS1(config-vlan)#name MULTIMEDIA
DLS1(config-vlan)#exit
DLS1(config)#vlan 3456
DLS1(config-vlan)#name PERSONAL
DLS1(config-vlan)#exit
DLS1(config)#spanning-tree vlan 1,12,434,500,1010,1111,3456 root primary
DLS1(config)#spanning-tree vlan 123,234 root secondary
DLS1(config)#interface port-channel 1
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:42:07.765: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (500), with ALS2 Ethernet2/0 (1).
*Nov 16 14:42:07.766: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (500), with ALS2 Ethernet2/1 (1).
DLS1(config)#interface port-channel 4
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS1(config-if)#ip routing
DLS1(config)#ipv6 unicast-routing
DLS1(config)#int vlan 12
DLS1(config-if)#ip address 10.0.12.252 255.255.255.0
DLS1(config-if)#no sh
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:42:11.032: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan12, changed state to
up
DLS1(config)#
*Nov 16 14:42:12.026: %LINK-3-UPDOWN: Interface Vlan12, changed state to up
DLS1(config)#
```

En el switch DLS1 se configuro como servidor principal y se creó 8 VLAN acordes a la tabla 5 del ejercicio, lo que genera los parámetros necesarios que lo hacen el servidor principal.

1.6. En DLS1, suspender la VLAN 434.

```
Configuración DLS1
vlan 434
name PROVEEDORES
state suspend
exit
```

Figura 39. Configuración 1.6 DLS 1

```
DLS1
DLS1(config)#vlan 434
DLS1(config-vlan)#name PROVEEDORES
DLS1(config-vlan)#state suspend
DLS1(config-vlan)#exit
DLS1(config)#vlan 12
DLS1(config-vlan)#name ADMON
DLS1(config-vlan)#exit
DLS1(config)#vlan 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#exit
DLS1(config)#vlan 234
DLS1(config-vlan)#name CLIENTES
DLS1(config-vlan)#exit
```

En el switch DLS1 se suspende la VLAN 434 o proveedores, esto obedeciendo a las directrices del escenario.

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

```
Configuración DLS2
vtp ver 2
vtp mode transparent
```

```

spanning-tree vlan 1,12,123,234,434,500,1010,3456 root secondary
spanning-tree vlan 123,234 root primary
vlan 500
name NATIVA
exit
vlan 434
name PROVEEDORES
state suspend
exit
vlan 12
name ADMON
exit
vlan 123
name SEGUROS
exit
vlan 234
name CLIENTES
exit
vlan 1010
name VENTAS
exit
vlan 1111
name MULTIMEDIA
exit
vlan 3456
name PERSONAL
exit

```

Figura 40. Configuración 1.7.1 DLS 2

```

DLS2
*Nov 16 14:54:27.680: %EC-5-CANNOT_BUNDLE2: Et2/1 is not compatible with Po3 and
will be suspended (vlan mask is different)
*Nov 16 14:54:28.679: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/
0, changed state to down
DLS2#
*Nov 16 14:54:29.693: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/
0, changed state to up
*Nov 16 14:54:30.684: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Po3 and
will be suspended (vlan mask is different)
*Nov 16 14:54:30.684: %EC-5-CANNOT_BUNDLE2: Et2/1 is not compatible with Po3 and
will be suspended (vlan mask is different)
DLS2#
DLS2#vtp ver 2
DLS2#vtp mode transparent
^
% Invalid input detected at '^' marker.

DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#vtp ver 2
VTP version is already in V2.
DLS2(config)#vtp mode transparent
Device mode already VTP Transparent for VLANS.
DLS2(config)#

```

Figura 41. Configuración 1.7.2 DLS 2

```
DLS2(config)#vtp mode transparent
Setting device to VTP Transparent mode for VLANs.
DLS2(config)#spanning-tree vlan 1,12,123,234,434,500,1010,3456 root secondary
DLS2(config)#spanning-tree vlan 123,234 root primary
DLS2(config)#vlan 500
DLS2(config-vlan)#name NATIVA
DLS2(config-vlan)#exit
DLS2(config)#vlan 434
DLS2(config-vlan)#name PROVEEDORES
DLS2(config-vlan)#state suspend
DLS2(config-vlan)#exit
DLS2(config)#vlan 12
DLS2(config-vlan)#name ADMON
DLS2(config-vlan)#exit
DLS2(config)#vlan 123
DLS2(config-vlan)#name SEGUROS
DLS2(config-vlan)#exit
DLS2(config)#vlan 234
DLS2(config-vlan)#name CLIENTES
DLS2(config-vlan)#exit
DLS2(config)#vlan 1010
DLS2(config-vlan)#name VENTAS
DLS2(config-vlan)#exit
DLS2(config)#vlan 1111
DLS2(config-vlan)#name MULTIMEDIA
DLS2(config-vlan)#exit
DLS2(config)#vlan 3456
DLS2(config-vlan)#name PERSONAL
DLS2(config-vlan)#exit
DLS2(config)#vlan 567
DLS2(config-vlan)#name PRODUCCION
DLS2(config-vlan)#exit
DLS2(config)#interface port-channel 2
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
Command rejected: Po2 not a switching port.
DLS2(config-if)#exit
DLS2(config)#interface port-channel 3
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS2(config-if)#exit
DLS2(config)#
*Nov 16 14:49:52.785: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Po3 and will be suspe
nded (vlan mask is different)
*Nov 16 14:49:52.785: %EC-5-CANNOT_BUNDLE2: Et2/1 is not compatible with Po3 and will be suspe
nded (vlan mask is different)
DLS2(config)#
```

Parametrización de VLAN en el DLS2, acorde con la tabla 5 proporcionada, se efectuaron los comandos de forma este switch quedara con un VTP transparente.

1.8. Suspende VLAN 434 en DLS2.

```
Configuración DLS2
vlan 434
name PROVEEDORES
state suspend
exit
```

Figura 42. Configuración 1.8 DLS 2

```
DLS2(config)#vtp mode transparent
Setting device to VTP Transparent mode for VLANs.
DLS2(config)#spanning-tree vlan 1,12,123,234,434,500,1010,3456 root secondary
DLS2(config)#spanning-tree vlan 123,234 root primary
DLS2(config)#vlan 500
DLS2(config-vlan)#name NATIVA
DLS2(config-vlan)#exit
DLS2(config)#vlan 434
DLS2(config-vlan)#name PROVEEDORES
DLS2(config-vlan)#state suspend
DLS2(config-vlan)#exit
DLS2(config)#vlan 12
DLS2(config-vlan)#name ADMON
DLS2(config-vlan)#exit
```

En el switch DLS2 se suspende la VLAN 434 o proveedores, esto obedeciendo a las directrices del escenario

1.9. 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.

Configuración DLS2
vlan 567
name PRODUCCION
exit

Figura 43. Configuración 1.9 DLS 2

```
DLS2(config)#vlan 567
DLS2(config-vlan)#name PRODUCCION
DLS2(config-vlan)#exit
DLS2(config)#interface port-channel 2
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
Command rejected: Po2 not a switching port.
DLS2(config-if)#exit
DLS2(config)#interface port-channel 3
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS2(config-if)#exit
DLS2(config)#
*Nov 16 14:49:52.785: %EC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Po3 and will be suspended (vlan mask is different)
*Nov 16 14:49:52.785: %EC-5-CANNOT_BUNDLE2: Et2/1 is not compatible with Po3 and will be suspended (vlan mask is different)
DLS2(config)#
```

Se crea la VLAN Producción en el DLS2, esto obedeciendo a las instrucciones del ejercicio a desarrollar.

- 1.10. 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.

Configuración DLS1

spanning-tree vlan 1,12,434,500,1010,1111,3456 root primary
spanning-tree vlan 123,234 root secondary

Figura 44. Configuración 1.10 DLS 1

```
DLS1
DLS1(config)#vlan 434
DLS1(config-vlan)#name PROVEEDORES
DLS1(config-vlan)#state suspend
DLS1(config-vlan)#exit
DLS1(config)#vlan 12
DLS1(config-vlan)#name ADMON
DLS1(config-vlan)#exit
DLS1(config)#vlan 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#exit
DLS1(config)#vlan 234
DLS1(config-vlan)#name CLIENTES
DLS1(config-vlan)#exit
DLS1(config)#vlan 1010
DLS1(config-vlan)#name VENTAS
DLS1(config-vlan)#exit
DLS1(config)#vlan 1111
DLS1(config-vlan)#name MULTIMEDIA
DLS1(config-vlan)#exit
DLS1(config)#vlan 3456
DLS1(config-vlan)#name PERSONAL
DLS1(config-vlan)#exit
DLS1(config)#spanning-tree vlan 1,12,434,500,1010,1111,3456 root primary
DLS1(config)#spanning-tree vlan 123,234 root secondary
DLS1(config)#interface port-channel 1
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:42:07.765: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet2/0 (500), with ALS2 Ethernet2/0 (1).
*Nov 16 14:42:07.766: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet2/1 (500), with ALS2 Ethernet2/1 (1).
DLS1(config)#interface port-channel 4
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS1(config-if)#ip routing
DLS1(config)#ipv6 unicast-routing
DLS1(config)#int vlan 12
DLS1(config-if)#ip address 10.0.12.252 255.255.255.0
DLS1(config-if)#no sh
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:42:11.032: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan12, changed state to up
DLS1(config)#
*Nov 16 14:42:12.026: %LINK-3-UPDOWN: Interface Vlan12, changed state to up
DLS1(config)#
```

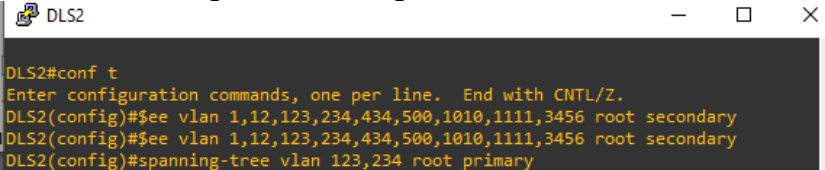
Se genera proceso de asignación de spanning-tree en el DLS1 en donde se especifica las VLAN primarias y secundarias, esto con el fin de establecer el sistema de las VLAN.

- 1.11. 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.

Configuración DLS2

```
spanning-tree vlan 1,12,123,234,434,500,1010,1111,3456 root secondary
spanning-tree vlan 123,234 root primary
```

Figura 45. Configuración 1.11 DLS 2



```
DLS2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config)#spanning-tree vlan 1,12,123,234,434,500,1010,1111,3456 root secondary
DLS2(config)#spanning-tree vlan 123,234 root primary
```

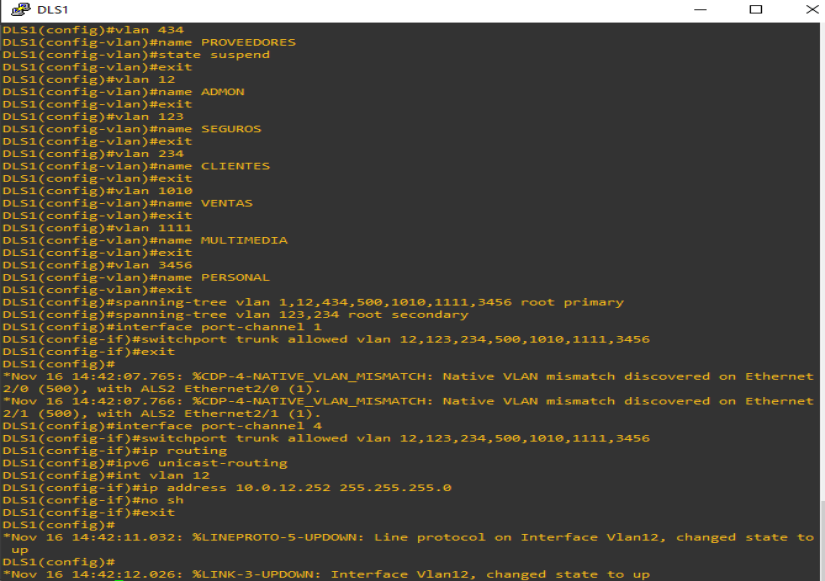
Se genera proceso de asignación de spanning-tree en el DLS2 en donde se especifica las VLAN primarias y secundarias, esto con el fin de establecer el sistema de las VLAN.

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

Configuración DLS1

```
interface port-channel 1
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
exit
interface port-channel 4
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
```

Figura 46. Configuración 1.12 DLS 1



```
DLS1(config)#vian 434
DLS1(config-vlan)#name PROVEEDORES
DLS1(config-vlan)#state suspend
DLS1(config-vlan)#exit
DLS1(config)#vian 12
DLS1(config-vlan)#name ADMON
DLS1(config-vlan)#exit
DLS1(config)#vian 123
DLS1(config-vlan)#name SEGUROS
DLS1(config-vlan)#exit
DLS1(config)#vian 234
DLS1(config-vlan)#name CLIENTES
DLS1(config-vlan)#exit
DLS1(config)#vian 1010
DLS1(config-vlan)#name VENTAS
DLS1(config-vlan)#exit
DLS1(config)#vian 1111
DLS1(config-vlan)#name MULTIMEDIA
DLS1(config-vlan)#exit
DLS1(config)#vian 3456
DLS1(config-vlan)#name PERSONAL
DLS1(config-vlan)#exit
DLS1(config)#spanning-tree vlan 1,12,434,500,1010,1111,3456 root primary
DLS1(config)#spanning-tree vlan 123,234 root secondary
DLS1(config)#interface port-channel 1
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:42:07.765: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (500), with ALS2 Ethernet2/0 (1).
*Nov 16 14:42:07.766: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (500), with ALS2 Ethernet2/1 (1).
DLS1(config)#interface port-channel 4
DLS1(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS1(config-if)#ip routing
DLS1(config)#ipv6 unicast-routing
DLS1(config)#int vlan 12
DLS1(config-if)#ip address 10.0.12.252 255.255.255.0
DLS1(config-if)#no sh
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:42:11.032: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan12, changed state to
up
DLS1(config)#
*Nov 16 14:42:12.026: %LINK-3-UPDOWN: Interface Vlan12, changed state to up
DLS1(config)#
```

Configuración DLS2

```
interface port-channel 2
```

```

switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
exit
interface port-channel 3
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
exit

```

Figura 47. Configuración 1.12 DLS 2

```

DLS2
DLS2(config)#vtp ver 3
DLS2(config)#vtp mode transparent
Setting device to VTP Transparent mode for VLANs.
DLS2(config)#spanning-tree vlan 1,12,123,234,434,500,1010,3456 root secondary
DLS2(config)#spanning-tree vlan 123,234 root primary
DLS2(config)#vlan 500
DLS2(config-vlan)#name NATIVA
DLS2(config-vlan)#exit
DLS2(config)#vlan 434
DLS2(config-vlan)#name PROVEEDORES
DLS2(config-vlan)#state suspend
DLS2(config-vlan)#exit
DLS2(config)#vlan 12
DLS2(config-vlan)#name ADMON
DLS2(config-vlan)#exit
DLS2(config)#vlan 123
DLS2(config-vlan)#name SEGUROS
DLS2(config-vlan)#exit
DLS2(config)#vlan 234
DLS2(config-vlan)#name CLIENTES
DLS2(config-vlan)#exit
DLS2(config)#vlan 434
DLS2(config-vlan)#name VENTAS
DLS2(config-vlan)#exit
DLS2(config)#vlan 1111
DLS2(config-vlan)#name MULTIMEDIA
DLS2(config-vlan)#exit
DLS2(config)#vlan 3456
DLS2(config-vlan)#name PERSONAL
DLS2(config-vlan)#exit
DLS2(config)#vlan 567
DLS2(config-vlan)#name PRODUCCION
DLS2(config-vlan)#exit
DLS2(config)#interface port-channel 2
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
Command rejected: Po2 not a switching port.
DLS2(config-if)#exit
DLS2(config)#interface port-channel 3
DLS2(config-if)#switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
DLS2(config-if)#exit
DLS2(config)#
*Nov 16 14:49:52.785: %SEC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Po3 and will be suspended (vlan mask is different)
*Nov 16 14:49:52.785: %SEC-5-CANNOT_BUNDLE2: Et2/1 is not compatible with Po3 and will be suspended (vlan mask is different)
DLS2(config)#

```

Configuración ALS1

```

int ran E0/1-2
channel-group 1 mode active
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit
int ran E2/0-1
channel-group 3 mode desirable
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit

```

Figura 48. Configuración 1.12 ALS 1

```

ALS1
te to down
*Nov 16 14:54:39.787: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
ALS1(config)#
*Nov 16 14:54:42.797: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
*Nov 16 14:54:42.798: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
ALS1(config)#int ran E0/1-2
ALS1(config-if-range)#channel-group 1 mode active
Creating a port-channel interface Port-channel 1
ALS1(config-if-range)#trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS1(config-if-range)#no shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:54:49.938: %SEC-5-CANNOT_BUNDLE2: Et0/1 is not compatible with Et0/2 and will be suspended (vlan mask is different)
*Nov 16 14:54:49.938: %SEC-5-CANNOT_BUNDLE2: Et0/1 is not compatible with Et0/2 and will be suspended (vlan mask is different)
*Nov 16 14:54:49.938: %SEC-5-COMPATIBLE: Et0/1 is compatible with port-channel members
ALS1(config)#
*Nov 16 14:54:55.114: %SEC-5-L3DONTBNDL2: Et0/2 suspended: LACP currently not enabled on the remote port.
ALS1(config)#
*Nov 16 14:54:56.621: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to up
ALS1(config)#int ran E2/0-1
ALS1(config-if-range)#channel-group 3 mode desirable
Creating a port-channel interface Port-channel 3
ALS1(config-if-range)#trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS1(config-if-range)#no shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:55:00.847: %SEC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Et2/1 and will be suspended (vlan mask is different)
*Nov 16 14:55:00.848: %SEC-5-CANNOT_BUNDLE2: Et2/0 is not compatible with Et2/1 and will be suspended (vlan mask is different)
*Nov 16 14:55:00.848: %SEC-5-COMPATIBLE: Et2/0 is compatible with port-channel members
ALS1(config)#
*Nov 16 14:55:01.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Nov 16 14:55:01.863: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
ALS1(config)#

```

Configuración ALS2

```

int ran E0/1-2
channel-group 2 mode active
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit
int ran E2/0-1
channel-group 4 mode desirable
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
no shut
exit
  
```

Figura 49. Configuración 1.12 ALS 2

```

ALS2
Nov 16 14:57:43.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
Nov 16 14:57:43.758: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to up
ALS2(config)#
Nov 16 14:57:44.287: %SPANTREE-7-RECV_IQ_NON_TRUNK: Received 802.1Q BPDU on non trunk Ethernet2/0 VLAN1
Nov 16 14:57:44.287: %SPANTREE-7-BLOCK_PORT_TYPE: Blocking Ethernet2/0 on VLAN0001. Inconsistent port type.
Nov 16 14:57:44.287: %SPANTREE-7-RECV_IQ_NON_TRUNK: Received 802.1Q BPDU on non trunk Ethernet2/1 VLAN1
Nov 16 14:57:44.287: %SPANTREE-7-BLOCK_PORT_TYPE: Blocking Ethernet2/1 on VLAN0001. Inconsistent port type.
ALS2(config)#
Nov 16 14:57:44.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
Nov 16 14:57:44.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up
ALS2(config)#int ran E0/1-2
ALS2(config-if-range)#channel-group 2 mode active
Creating a port-channel interface Port-channel 2
ALS2(config-if-range)#trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
Nov 16 14:58:02.884: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
Nov 16 14:58:02.885: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
ALS2(config)#int ran E2/0-1
ALS2(config-if-range)#channel-group 4 mode desirable
Creating a port-channel interface Port-channel 4
ALS2(config-if-range)#trunk allowed vlan 12,123,234,500,1010,1111,3456
ALS2(config-if-range)#no shut
ALS2(config-if-range)#exit
ALS2(config)#
Nov 16 14:58:10.032: %EC-5-L3DONTBNL2: Et0/1 suspended: LACP currently not enabled on the remote port.
Nov 16 14:58:10.342: %EC-5-L3DONTBNL2: Et0/2 suspended: LACP currently not enabled on the remote port.
ALS2(config)#
Nov 16 14:58:11.933: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up
ALS2(config)#
  
```

Se establecen todos los puertos de los switches DLS1 y DLS 2 como troncales de tal forma que solamente las VLAN que se han creado se les permitirá circular a través de estos puertos.

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

Tabla 6. Interfaces a Puertos

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		

Configuración DLS1

```
interface E0/0
```

```

switchport host
switchport access vlan 3456
no shut
exit
interface E3/0
swi host
swi ac v 1111
no sh
exit
int ran E3/0-3
swi host
swi ac v 434
shut
exit

```

Figura 50. Configuración 1.13 DLS 1

```

DLS1
spanning-tree portfast will be enabled
channel group will be disabled

DLS1(config-if)#switchport access vlan 3456
DLS1(config-if)#no shut
DLS1(config-if)#exit
DLS1(config)#
*Nov 16 14:43:25.911: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
*Nov 16 14:43:26.913: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up
DLS1(config)#interface E3/0
DLS1(config-if)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

DLS1(config-if)#swi ac v 1111
DLS1(config-if)#no sh
DLS1(config-if)#exit
DLS1(config)#int ran E3/0-3
DLS1(config-if-range)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

DLS1(config-if-range)#swi ac v 434
DLS1(config-if-range)#shut
DLS1(config-if-range)#exit
DLS1(config)#
*Nov 16 14:43:52.688: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Nov 16 14:43:52.688: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Nov 16 14:43:52.688: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
*Nov 16 14:43:52.688: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
*Nov 16 14:43:53.686: %LINK-5-CHANGED: Interface Ethernet3/0, changed state to administratively down
*Nov 16 14:43:53.697: %LINK-5-CHANGED: Interface Ethernet3/1, changed state to administratively down
*Nov 16 14:43:53.697: %LINK-5-CHANGED: Interface Ethernet3/2, changed state to administratively down
*Nov 16 14:43:53.697: %LINK-5-CHANGED: Interface Ethernet3/3, changed state to administratively down
DLS1(config)#

```

Configuración DLS2

```

interface e0/0
switchport host
switchport access vlan 12
switchport VENTAS vlan 1010
no shut
exit
int E3/0
swi host
swi ac v 1111
no sh
exit
int ran E3/1-3
swi host

```

```

swi ac v 567
no shut
exit
int ran E3/0-3
swi host
swi ac v 434
shut
exit

```

Figura 51. Configuración 1.13 DLS 2

```

DLS2
DLS2(config)#interface e0/0
DLS2(config-if)#switchport host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

DLS2(config-if)#switchport access vlan 12
DLS2(config-if)#switchport VENTAS vlan 1010
^
% Invalid input detected at '^' marker.

DLS2(config-if)#no shut
DLS2(config-if)#exit
DLS2(config)#
*Nov 16 14:51:29.773: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
*Nov 16 14:51:30.773: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up
DLS2(config)#int E3/0
DLS2(config-if)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

DLS2(config-if)#swi ac v 1111
DLS2(config-if)#no sh
DLS2(config-if)#exit
DLS2(config)#int ran E3/1-3
DLS2(config-if-range)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

DLS2(config-if-range)#swi ac v 567
DLS2(config-if-range)#no shut
DLS2(config-if-range)#exit
DLS2(config)#int ran E3/0-3
DLS2(config-if-range)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

DLS2(config-if-range)#swi ac v 434
DLS2(config-if-range)#shut
DLS2(config-if-range)#exit
DLS2(config)#
*Nov 16 14:52:08.574: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down

```

Configuración ALS1

```

int E0/0
switchport host
switchport access vlan 123
switchport VENTAS vlan 1010
no shut
exit
int E3/0
swi host
swi ac v 1111
no sh
exit
int ran E3/0-3
swi host
swi ac v 434
shut
exit

```

Figura 52 Configuración 1.13 ALS 1

```
ALS1
Setting device VTP password to ccnp321
ALS1(config)#int E0/0
ALS1(config-if)#switchport host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

ALS1(config-if)#switchport access vlan 123
ALS1(config-if)#switchport VENTAS vlan 1010
^
% Invalid input detected at '^' marker.

ALS1(config-if)#no shut
ALS1(config-if)#exit
ALS1(config)#
*Nov 16 14:55:43.773: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
*Nov 16 14:55:44.773: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up
ALS1(config)#int E3/0
ALS1(config-if)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

ALS1(config-if)#swi ac v 1111
ALS1(config-if)#no sh
ALS1(config-if)#exit
ALS1(config)#
*Nov 16 14:55:55.725: %LINK-3-UPDOWN: Interface Vlan3456, changed state to up
*Nov 16 14:55:56.725: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan3456, changed state to up
ALS1(config)#int ran E3/0-3
ALS1(config-if-range)#swi host
switchport mode will be set to access
spanning-tree portfast will be enabled
channel group will be disabled

ALS1(config-if-range)#swi ac v 434
ALS1(config-if-range)#shut
ALS1(config-if-range)#exit
ALS1(config)#
*Nov 16 14:56:01.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Nov 16 14:56:01.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Nov 16 14:56:01.765: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
```

Configuración ALS2

```
int E0/0
switchport host
switchport access vlan 234
no shut
exit
int E3/0
swi host
swi ac v 1111
no sh
exit
int ran E3/1-3
swi host
swi ac v 434
shut
exit
```


Figura 57. Configuración 2.4 DLS 1

```
DLS1
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/1
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/2
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/3
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Vlan1
no ip address
shutdown
!
interface Vlan12
ip address 10.0.12.252 255.255.255.0
!
interface Vlan123
ip address 10.0.123.252 255.255.255.0
!
interface Vlan234
ip address 10.0.234.252 255.255.255.0
!
interface Vlan1010
ip address 10.10.10.252 255.255.255.0
!
interface Vlan1111
ip address 10.11.11.252 255.255.255.0
!
interface Vlan3456
ip address 10.34.56.252 255.255.255.0
```

Figura 58. Configuración 2.5 DLS 1

```
DLS1
interface Vlan1
no ip address
shutdown
!
interface Vlan12
ip address 10.0.12.252 255.255.255.0
!
interface Vlan123
ip address 10.0.123.252 255.255.255.0
!
interface Vlan234
ip address 10.0.234.252 255.255.255.0
!
interface Vlan1010
ip address 10.10.10.252 255.255.255.0
!
interface Vlan1111
ip address 10.11.11.252 255.255.255.0
!
interface Vlan3456
ip address 10.34.56.252 255.255.255.0
!
!
no ip http server
!
!
!
control-plane
!
!
line con 0
exec-timeout 0 0
privilege level 15
logging synchronous
line aux 0
exec-timeout 0 0
privilege level 15
logging synchronous
line vty 0 4
login
!
end
DLS1#
```


Figura 61. Configuración 2.3 DLS 2

```
DLS2
interface Port-channel3
 switchport
 switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
!
interface Port-channel2
 no ip address
!
interface Port-channel12
 ip address 10.12.12.2 255.255.255.252
!
interface Ethernet0/0
 switchport access vlan 12
 switchport mode access
 duplex auto
 spanning-tree portfast
!
interface Ethernet0/1
 no switchport
 no ip address
 channel-group 2 mode active
!
interface Ethernet0/2
 no switchport
 no ip address
 channel-group 2 mode active
!
interface Ethernet0/3
 duplex auto
!
interface Ethernet1/0
 duplex auto
!
interface Ethernet1/1
 shutdown
 duplex auto
!
interface Ethernet1/2
 shutdown
 duplex auto
!
interface Ethernet1/3
 duplex auto
!
interface Ethernet2/0
 duplex auto
 channel-group 3 mode desirable
```

Figura 62. Configuración 2.4 DLS 2

```
DLS2
interface Ethernet2/0
 duplex auto
 channel-group 3 mode desirable
!
interface Ethernet2/1
 duplex auto
 channel-group 3 mode desirable
!
interface Ethernet2/2
 duplex auto
!
interface Ethernet2/3
 duplex auto
!
interface Ethernet3/0
 switchport access vlan 434
 switchport mode access
 shutdown
 duplex auto
 spanning-tree portfast
!
interface Ethernet3/1
 switchport access vlan 434
 switchport mode access
 shutdown
 duplex auto
 spanning-tree portfast
!
interface Ethernet3/2
 switchport access vlan 434
 switchport mode access
 shutdown
 duplex auto
 spanning-tree portfast
!
interface Ethernet3/3
 switchport access vlan 434
 switchport mode access
 shutdown
 duplex auto
 spanning-tree portfast
!
interface Vlan1
 no ip address
 shutdown
!
```

Figura 63. Configuración 2.5 DLS 2

```
DLS2
interface Ethernet3/3
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Vlan1
no ip address
shutdown
!
interface Vlan12
ip address 10.0.12.253 255.255.255.0
!
interface Vlan123
ip address 10.0.123.253 255.255.255.0
!
interface Vlan234
ip address 10.0.234.253 255.255.255.0
!
interface Vlan1010
ip address 10.10.10.253 255.255.255.0
!
interface Vlan1111
ip address 10.11.11.253 255.255.255.0
!
interface Vlan3456
ip address 10.34.56.253 255.255.255.0
!
no ip http server
!
!
!
!
control-plane
!
!
line con 0
exec-timeout 0 0
privilege level 15
logging synchronous
line aux 0
exec-timeout 0 0
privilege level 15
```

Figura 64. Configuración 2.6 DLS 2

```
DLS2
interface Vlan1
no ip address
shutdown
!
interface Vlan12
ip address 10.0.12.253 255.255.255.0
!
interface Vlan123
ip address 10.0.123.253 255.255.255.0
!
interface Vlan234
ip address 10.0.234.253 255.255.255.0
!
interface Vlan1010
ip address 10.10.10.253 255.255.255.0
!
interface Vlan1111
ip address 10.11.11.253 255.255.255.0
!
interface Vlan3456
ip address 10.34.56.253 255.255.255.0
!
!
!
no ip http server
!
!
!
!
control-plane
!
!
line con 0
exec-timeout 0 0
privilege level 15
logging synchronous
line aux 0
exec-timeout 0 0
privilege level 15
logging synchronous
line vty 0 4
login
!
end
DLS2#
```


Figura 67. Configuración 2.3 ALS 1

```
ALS1
interface Ethernet1/0
duplex auto
!
interface Ethernet1/1
shutdown
duplex auto
!
interface Ethernet1/2
shutdown
duplex auto
!
interface Ethernet1/3
duplex auto
!
interface Ethernet2/0
switchport trunk native vlan 500
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
duplex auto
channel-group 3 mode desirable
!
interface Ethernet2/1
switchport trunk native vlan 500
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
duplex auto
channel-group 3 mode desirable
!
interface Ethernet2/2
duplex auto
!
interface Ethernet2/3
duplex auto
!
interface Ethernet3/0
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/1
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
```

Figura 68. Configuración 2.4 ALS 1

```
ALS1
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/2
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/3
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Vlan1
no ip address
shutdown
!
!
no ip http server
!
!
!
control-plane
!
!
line con 0
exec-timeout 0 0
privilege level 15
logging synchronous
line aux 0
exec-timeout 0 0
privilege level 15
logging synchronous
line vty 0 4
login
!
end
```


Figura 71. Configuración 2.3 ALS 2

```
ALS2
interface Ethernet1/1
shutdown
duplex auto
!
interface Ethernet1/2
shutdown
duplex auto
!
interface Ethernet1/3
duplex auto
!
interface Ethernet2/0
switchport trunk native vlan 500
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
duplex auto
channel-group 4 mode desirable
!
interface Ethernet2/1
switchport trunk native vlan 500
switchport trunk allowed vlan 12,123,234,500,1010,1111,3456
duplex auto
channel-group 4 mode desirable
!
interface Ethernet2/2
duplex auto
!
interface Ethernet2/3
duplex auto
!
interface Ethernet3/0
switchport access vlan 1111
switchport mode access
duplex auto
spanning-tree portfast
!
interface Ethernet3/1
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/2
switchport access vlan 434
switchport mode access
shutdown
```

Figura 72. Configuración 2.4 ALS 2

```
ALS2
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/2
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Ethernet3/3
switchport access vlan 434
switchport mode access
shutdown
duplex auto
spanning-tree portfast
!
interface Vlan1
no ip address
shutdown
!
!
no ip http server
!
!
!
!
control-plane
!
line con 0
exec-timeout 0 0
privilege level 15
logging synchronous
line aux 0
exec-timeout 0 0
privilege level 15
logging synchronous
line vty 0 4
login
!
end
ALS2#
```

Se comprobó que cada una de las conexiones y configuraciones realizadas en cada uno de los dispositivos de la red cumplen y se comunican de manera exitosa.

CONCLUSIONES

En el trabajo anterior se presentó los conocimientos adquiridos por medio de los diferentes niveles de la plataforma Cisco y dentro del diplomado para la resolución del escenario a desarrollar.

Acorde con el escenario 1 se visualiza una correcta configuración acorde con los métodos de enrutamiento OSPF y EIGRP, los cuales demuestran la comunicación entre los 5 routers utilizados en el desarrollo del ejercicio.

Para el escenario 2, se realizó la configuración de diversas VLAN en los switches de modo que se generara un proceso de descubrimiento autónomo en la red, lo anterior permite la comunicación entre los diferentes elementos que integran la red y establecen un direccionamiento para cada uno de estos.

Durante el desarrollo de los escenarios se realizaron diferentes configuraciones con sus correspondientes protocolos de enrutamientos, en donde se presentó el método de manejo de diferentes interfaces loopback con su correspondiente identificador "direcciones IP", se validó el método de manejo de enrutamiento implementando EIGRP y OSPF, se verificó el estado de la conexión por medio de la tabla de enrutamiento del proceso configurado en cada uno de los dispositivos.

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