EVALUACIÓN FINAL

PRUEBA DE HABILIDADES PRÁCTICAS CISCO CCNP

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA INGENIERÍA ELECTRÓNICA DIPLOMADO CISCO CCNP YOPAL 2019

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Diplomado de profundización cisco CCNP prueba de Habilidades prácticas

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NOTA DE ACEPTACIÓN:

Presidente del Jurado

Jurado

Jurado

Yopal, 12 de diciembre de 2019

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GLOSARIO

CCNP: Cisco Certified Network Professional.

GNS3: Es un simulador gráfico de red, que permite diseñar topologías de red complejas, permitiendo la combinación de dispositivos tanto reales como virtuales.

NETWORKING: Implica, básicamente, aumentar tu red de contactos profesionales.

EIGRP: Protocolo de enrutamiento de puerta de enlace interior mejorado, el cual usa como parámetro la distancia y calidad del canal.

PROTOCOLO DE RED: Designa el conjunto de reglas que rigen el intercambio de información a través de una red de computadoras.

OSPF: Protocolo de enrutamiento que proporciona la ruta más corta.

VLAN: Grupos redes de computadoras que se comportan como si estuviesen conectados al mismo computador.

ETHERCHANNEL: Permite la agrupación lógica de varios enlaces físicos Ethernet, y así obtener un enlace troncal de alta velocidad.

DHCP: Protocolo de configuración de host dinámico, utilizado en redes donde asigna automáticamente una dirección IP

RESUMEN

En el siguiente informe se muestra el paso a paso de la evaluación denominada "Prueba de habilidades prácticas", con las actividades evaluativas del Diplomado de Profundización CCNP, consiste en el proceso de conceptualización de los diversos temas del área de networking y seguridad los cuales se apreciaron durante el desarrollo del diplomado, a su vez la aplicación práctica de los mismos sobre diversos esquemas topológicos de red para los módulos de CCNP ROUTE y CCNA SWITCH en ambientes de simulación lógica. El objetivo principal es el enriquecimiento del estudiante en un área de profundización del área de telecomunicaciones que permita poseer una base práctica para el mejoramiento del pensamiento crítico y la capacidad de análisis proactivo sobre plataforma de red, el análisis de situaciones conflictivas que permitan al estudiante entender el funcionamiento de corta mediana y gran envergadura.

Palabras Claves: Networking, CCNP, CCNA, Swich, Route, Redes, Enrutamiento, Seguridad, Topología.

ABSTRACT

The following report shows the step-by-step evaluation called "Practical skills test", with the evaluation activities of the CCNP Deepening Diploma, it consists of the process of conceptualization of the various topics of the area of networking and security which are they appreciated during the development of the diploma, in turn the practical application of them on various network topological schemes for CCNP ROUTE and CCNA SWITCH modules in logical simulation environments. The main objective is the enrichment of the student in an area of deepening of the telecommunications area that allows to have a practical basis for the improvement of critical thinking and the ability of proactive analysis on a network platform, the analysis of conflict situations that allow the student to understand The operation of short medium and large wingspan.

Keywords: Networking, CCNP, CCNA, Swich, Route, Networks, Routing, Security, Topology.

INTRODUCCIÓN

Durante esta actividad practica se desarrollaron dos escenarios, uno con router y el otro con switch, que permitían la configuración de diversos escenarios trabajados durante el diplomado, entre estos se encuentran las configuraciones básicas para ambos dispositivos asignación de nombres, cableado, asignación de IP tanto IPv4 como IPv6, entre otros, así como la configuración de protocolos como Ethernet, OSPF, EIGRP y VTP.

En este documento encontrará los comandos necesarios para realizar dichas configuraciones, seguidas de la imagen que implementa, está en un software de diseño GNS3.

La importancia principal de esta actividad, es relacionar los comandos de acuerdo a una solicitud y necesidad específica, que permita la configuración avanzada tanto de routers como de switchs, dando solución a un incidente que se puede presentar en nuestro ambiente laboral.

En concordancia con lo anterior a continuación, este informe contiene las evidencias de configuración de los dispositivos para los escenarios planteados.

DESARROLLO

1. ESCENARIO 1

Una empresa de confecciones posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.



Configurar la topología de red, de acuerdo con las siguientes especificaciones.

1.1. Parte 1: Configuración del escenario propuesto.

1.2. Configurar las interfaces con las direcciones IPv4 e IPv6 que se muestran en la topología de red.

Se adjunta código y pantallazos con veracidad del código.



R1

R1#configure ter

R1(config)#hostname R1

R1(config)#ipv6 unicast-routing

R1(config)#interface e0/0

R1(config-if)#ip address 192.168.110.1 255.255.255.0

R1(config-if)#ipv6 address 2001:db8:acad:110::1/64

R1(config-if)#no shutdown

R1(config-if)#interface s2/0

R1(config-if)#ip address 192.168.9.1 255.255.255.0

R1(config-if)#ipv6 address 2001:db8:acad:90::1/64

Figura 3. Aplicando código R1

Rl# conf ter
Enter configuration commands, one per line. End with CNTL/2.
Rl(config)# #hostname Rl
Rl(config)#ipv6 unicast-routing
Rl(config)##interface e0/0
Rl(config)#ip address 192.168.110.1 255.255.255.0
% Invalid input detected at '^' marker.
Rl(config)#interface e0/0
Rl(config-if)#ip address 192.168.110.1 255.255.255.0
Rl(config-if)# ipv6 address 2001:db8:acad:110::1/64
Rl(config-if)# no shutdown
Rl(config-if)#
*Dec 7 19:39:53.602: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
*Dec 7 19:39:54.602: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, change
Rl(config-if)# interface s2/0
Rl(config-if)# ip address 192.168.9.1 255.255.255.0
Rl(config-if)#ipv6 address 2001:db8:acad:90::1/64
R1(config-if)

R2

R2# conf ter R2(config)#hostname R2 R2(config)#ipv6 unicast-routing R2(config)#interface e0/0 R2(config-if)# ip address 192.168.2.1 255.255.255.0 R2(config-if)# ipv6 address 2001:db8:acad:b::1/64 R2(config-if)# no shutdown R2(config-if)# interface s2/0 R2(config-if)# ip address 192.168.9.2 255.255.255.0 R2(config-if)# ipv6 address 2001:db8:acad:90::2/64 R2(config-if)# bandwidth 128 R2(config-if)# no shutdown R2(config-if)# interface s2/1 R2(config-if)# interface s2/1 R2(config-if)# ip address 192.168.9.5 255.255.255.0 R2(config-if)# ipv6 address 2001:db8:acad:91::1/64

Figura 4. Aplicando código R2

```
R2# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)# hostname R2
R2(config)#ipv6 unicast-routing
R2(config)#interface e0/0
R2(config-if)# ip address 192.168.2.1 255.255.255.0
R2(config-if)# ipv6 address 2001:db8:acad:b::1/64
R2(config-if)# no shutdown
*Dec 7 19:49:48.926: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
*Dec 7 19:49:49.927: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state
R2(config-if)# interface s2/0
Incomplete command.
R2(config-if)# ip address 192.168.9.2 255.255.255.0
R2(config-if)# ipv6 address 2001:db8:acad:90::2/64
R2(config-if)# bandwidth 128
R2(config-if)# no shutdown
R2(config-if)#
*Dec 7 19:55:00.226: %LINK-3-UPDOWN: Interface Serial2/0, changed state to up
*Dec 7 19:55:01.228: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state t
R2(config-if)# interface s2/1
*Dec 7 19:55:27.219: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state t
 2(config-if)# interface s2/1
R2(config-if)#ip address 192.168.9.5 255.255.255.0
192.168.9.0 overlaps with Serial2/0
R2(config-if)#_ipv6 address 2001:db8:acad:91::1/64
 2(config-if)#
```

R3

R3# conf ter R3(config)# hostname R3 R3(config)# ipv6 unicast-routing R3(config)# interface e0/0 R3(config-if)# ip address 192.168.3.1 255.255.255.0 R3(config-if)# ipv6 address 2001:db8:acad:c::1/64 R3(config-if)# no shutdown R3(config-if)# interface s2/1 R3(config-if)# ip address 192.168.9.6 255.255.255.0 R3(config-if)# ipv6 address 2001:db8:acad:91::2/64

Figura 5. Aplicando código R3

```
R3# conf ter
Enter configuration commands, one per line. End with CNTL/2.
R3(config) # hostname R3
R3(config)# ipv6 unicast-routing
R3(config)# interface FastEther0/0
Invalid input detected at '^' marker.
R3(config)# interface e0/0
R3(config-if)# ip address 192.168.3.1 255.255.255.0
R3(config-if)# ipv6 address 2001:db8:acad:c::1/64
R3(config-if)#no shutdown
R3(config-if)#
*Dec 7 19:59:34.439: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
*Dec 7 19:59:35.447: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0,
R3(config-if)# interface s2/1
R3(config-if)# ip address 192.168.9.6 255.255.255.0
R3(config-if)# ipv6 address 2001:db8:acad:91::2/64
R3(config-if)#
```

1.3. Ajustar el ancho de banda a 128 kbps sobre cada uno de los enlaces seriales ubicados en R1, R2, y R3 y ajustar la velocidad de reloj de las conexiones de DCE según sea apropiado.

R1

R1(config)# int s2/0 R1(config-if)# bandwidth 128 R1(config-if)# clock rate 128000 R1(config-if)# exit

Figura 6. Ajustar ancho de banda en R1

```
Rl(config)#int s2/0
Rl(config-if)#bandwidth 128
Rl(config-if)# clock rate 128000
*
% Invalid input detected at '^' marker.
Rl(config-if)# exit
Rl(config)#
```

R2(config-if)#bandwidth 128 R2(config-if)#clock rate 128000 R2(config-if)#exit

Figura 7. Ajustar ancho de banda en R2

R2(config-if) # bandwidth 128 R2(config-if) # clock rate 128000

R3

R3(configb if)# bandwidth 128 R3(config-if)#exit





1.4. En R2 y R3 configurar las familias de direcciones OSPF para IPv4. Utilice el identificador de enrutamiento 2.2.2.2 en R2 y 3.3.3.3 en R3 para ambas familias de direcciones.

R2

R2# conf ter R2(config-if)# router ospfv3 1 R2(config-router)# address-family ipv4 unicast R2(config-router-af)# router-id 2.2.2.2 R2(config-router-af)# exit-address-family R2(config-router)# address-family ipv6 unicast R2(config-router-af)# router-id 2.2.2.2 R2(config-router-af)# exit-address-family

Figura 9. Configuración OSPFV3 en R2

```
R2# conf ter
Enter configuration commands, one per line. End with CNTL/2.
R2(config) # router ospfv3 l
R2(config-router) # address-family ipv4 unicast
R2(config-router-af) # router-id 2.2.2.2
R2(config-router-af) # exit-address-family
R2(config-router) # address-family ipv6 unicast
R2(config-router-af) # router-id 2.2.2.2
R2(config-router-af) # router-id 2.2.2.2
R2(config-router-af) # exit-address-family
R2(config-router-af) # exit-address-family
R2(config-router) #
```

R3

R3# conf ter

R3(config-if)# router ospfv3 1 R3(config-router)# address-family ipv4 unicast R3(config-router-af)# router-id 3.3.3.3 R3(config-router-af)# passive-interface e0/0 R3(config-router-af)# exit-address-family R3(config-router)# address-family ipv6 unicast R3(config-router-af)# router-id 3.3.3.3 R3(config-router-af)# passive-interface e0/0 R3(config-router-af)# exit-address-family

```
Figura 10. Configuración OSPFV3 en R3
```

```
R3# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
R3(config) # router ospfv3 1
R3(config-router) # address-family ipv4 unicast
R3(config-router-af) # router-id 3.3.3.3
R3(config-router-af) # passive-interface e0/0
R3(config-router-af) # exit-address-family
R3(config-router) # address-family ipv6 unicas
R3(config-router-af) # router-id 3.3.3.3
R3(config-router-af) # passive-interface e0/0
R3(config-router-af) # passive-interface e0/0
R3(config-router-af) # passive-interface e0/0
R3(config-router-af) # exit-address-family
R3(config-router-af) # exit-address-family
R3(config-router) #
```

1.5. En R2, configurar la interfaz G0/0 en el área 1 de OSPF y la conexión serial entre R2 y R3 en OSPF área 0.

R2(config)# inter e0/0 R2(config-if)# ospfv3 1 ipv4 area 1 R2(config-if)#ospfv3 1 ipv6 area 1 R2(config-if)#interface s2/1 R2(config-if)#ospfv3 1 ipv4 area 0 R2(config-if)#ospfv3 1 ipv6 area 0

Figura 11. Configuración interfaz en el área 1 OSPFV3 en R2

```
X2(config) # interface e0/0
X2(config-if) # ospfv3 1 ipv4 area 1
X2(config-if) # ospfv3 1 ipv6 area 1
X2(config-if) # interface s2/1
X2(config-if) # ospfv3 1 ipv4 area 0
X2(config-if) # ospfv3 1 ipv6 area 0
X2(config-if) #
```

1.6. En R3, configurar la interfaz G0/0 y la conexión serial entre R2 y R3 en OSPF área 0.

R3

R3(config)#inter e0/0 R3(config-if)#ospfv3 1 ipv4 area 0 R3(config-if)#ospfv3 1 ipv6 area 0 R3(config-if)#interface s2/1 R3(config-if)#ospfv3 1 ipv4 area 0 R3(config-if)#ospfv3 1 ipv6 area 0

Figura 12. Configuración interfaz en el área 0 OSPFV3 en R3

```
R3# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)# interface e0/0
R3(config-if)# ospfv3 1 ipv4 area 0
R3(config-if)# ospfv3 1 ipv6 area 0
R3(config-if)# interface s2/1
R3(config-if)# ospfv3 1 ipv4 area 0
R3(config-if)# ospfv3 1 ipv6 area 0
R3(config-if)#
R3(config-if)#
```

1.7. Configurar el área 1 como un área totalmente Stubby.

R2

R2(config)# router ospfv3 1 R2(config-router)# address-family ipv4 unicast R2(config-router-af)# area 1 stub no-summary R2(config-router-af)# exit-address-family R2(config-router)# address-family ipv6 unicast R2(config-router-af)# area 1 stub no-summary R2(config-router-af)# exit-address-family R2(config-router)# exit

```
Figura 13. Configuración área totalmente Stubby en R2
```

```
R2# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
R2(config) # router ospfv3 l
R2(config-router) # address-family ipv4 unicast
R2(config-router-af) # area l stub no-summary
R2(config-router-af) # exit-address-family
R2(config-router) # address-family ipv6 unicast
R2(config-router-af) # area l stub no-summary
R2(config-router-af) # area l stub no-summary
R2(config-router-af) # exit-address-family
R2(config-router-af) # exit-address-family
R2(config-router-af) # exit-address-family
R2(config-router) # exit-address-family
R2(config-router) # exit
```

1.8. Propagar rutas por defecto de IPv4 y IPv6 en R3 al interior del dominio OSPFv3.

Nota: Es importante tener en cuenta que una ruta por defecto es diferente a la definición de rutas estáticas.

R3

R3# conf ter R3(config)# router ospfv3 1 R3(config-router)# address-family ipv4 unicast R3(config-router-af) #default-information originate always R3(config-router-af)# exit-address-family R3(config-router)# address-family ipv6 unicast R3(config-router-af)# default-information originate always R3(config-router-af)# exit-address-family

R2

Figura 14. Propagación rutas por defecto en R3

```
R3(config) # router ospfv3 1
R3(config-router) # address-family ipv4 unicast
R3(config-router-af) # default-information originate always
R3(config-router-af) # exit-address-family
R3(config-router) # address-family ipv6 unicast
R3(config-router-af) # default-information originate always
R3(config-router-af) # exit-address-family
R3(config-router) # exit
R3(config-router) # exit
R3(config-router) # exit
```

- 1.9. Realizar la configuración del protocolo EIGRP para IPv4 como IPv6. Configurar la interfaz F0/0 de R1 y la conexión entre R1 y R2 para EIGRP con el sistema autónomo 101. Asegúrese de que el resumen automático está desactivado.
- 1.10. Configurar las interfaces pasivas para EIGRP según sea apropiado.

R1

R1# conf ter

R1(config)# router eigrp DUAL-STACK

R1(config-router)# address-family ipv4 unicast autonomous-system 4

R1(config-router-af)# af-interface e0/0

R1(config-router-af-interface)#passive-interface

R1(config-router-af-interface)# exit-af-interface

R1(config-router-af)# topology base

R1(config-router-af-topology)# exit-af-topology

R1(config-router-af)# network 192.168.9.0 0.0.0.3

R1(config-router-af)# network 192.168.110.0 0.0.0.3

R1(config-router-af)# eigrp router-id 1.1.1.1

R1(config-router-af)# exit-address-family

R1(config-router)# address-family ipv6 unicast autonomous-system 6

R1(config-router-af)# af-interface e0/0

R1(config-router-af-interface)# passive-interface

R1(config-router-af-interface)# exit-af-interface

R1(config-router-af)# topology base

R1(config-router-af-topology)# exit-af-topology

R1(config-router-af)# eigrp router-id 1.1.1.1

R1(config-router-af)# exit-address-family

Figura 15. Configuración EIGRP en R1

```
l# conf ter
nter configuration commands, one per line. End with CNTL/Z.
{l(config) # router eigrp DUAL-STACK
Rl(config-router)# address-family ipv4 unicast autonomous-system 4
l(config-router-af)# af-interface e0/0
&l(config-router-af-interface) # passive-interface
Rl(config-router-af-interface) # exit-af-interface
ll(config-router-af)# topology base
&l(config-router-af-topology)# exit-af-topology
R1(config-router-af)# network 192.168.9.0 0.0.0.3
R1(config-router-af)# network 192.168.110.0 0.0.0.3
Rl(config-router-af)# eigrp router-id 1.1.1.1
&l(config-router-af)# exit-address-family
Rl(config-router)# address-family ipv6 unicast autonomous-system 6
&l(config-router-af)# af-interface e0/0
&l(config-router-af-interface) # passive-interface
Rl(config-router-af)# topology base
&l(config-router-af-topology)# exit-af-topology
R1(config-router-af)# eigrp router-id 1.1.1.1
Rl(config-router-af)# exit-address-family
ll(config-router) # exit
l(config)#
```

R2

R2(config)# router eigrp DUAL-STACK R2(config-router)# address-family ipv4 unicast autonomous-system 4 R2(config-router-af)#network 192.168.9.0 0.0.0.3 R2(config-router-af)#eigrp router-id 2.2.2.2 R2(config-router-af)#exit-address-family R2(config-router-af)#exit-address-family R2(config-router)#address-family ipv6 unicast autonomous-system 6 R2(config-router-af)# af-interface e0/0 R2(config-router-af-interface)#shutdown R2(config-router-af-interface)#exit-af-interface R2(config-router-af)#af-interface s2/1 R2(config-router-af-interface)#shutdown R2(config-router-af-interface)#exit-af-interface R2(config-router-af-interface)#exit-af-interface R2(config-router-af)#eigrp router-id 2.2.2.2 R2(config-router-af)#exit-address-family

Figura 16. Configuración EIGRP en R2

R2# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)# router ospfv3 1
R2(config-router)# address-family ipv4 unicast
R2(config-router-af)# area 1 stub no-summary
R2(config-router-af)# exit-address-family
R2(config-router)# address-family ipv6 unicast
R2(config-router-af)# area 1 stub no-summary
R2(config-router-af)# exit-address-family
R2(config-router)#exit
R2(config)# router eigrp DUAL-STACK
R2(config-router)# address-family ipv4 unicast autonomous-system 4
R2(config-router-af)#network 192.168.9.0 0.0.0.3
R2(config-router-af)# eigrp router-id 2.2.2.2
R2(config-router-af)# exit-address-family
R2(config-router)# address-family ipv6 unicast autonomous-system 6
R2(config-router-af)# af-interface e0/0
R2(config-router-af-interface)# shutdown
R2(config-router-af-interface)# exit-af-interface
R2(config-router-af)# af-interface s2/1
R2(config-router-af-interface)# shutdown
R2(config-router-af-interface)# exit-af-interface
R2(config-router-af)# eigrp router-id 2.2.2.2
R2(config-router-af)#exit-address-family
R2(config-router)#exit
R2(config)#

1.11. En R2, configurar la redistribución mutua entre OSPF y EIGRP para IPv4 e IPv6. Asignar métricas apropiadas cuando sea necesario.

R2

R2(config)# router eigrp DUAL-STACK

R2(config-router)#address-family ipv4 unicast autonomous-system 4

R2(config-router-af)#topology base

R2(config)#distribute-list R3-to-R1 out

R2(config-router-af-topology)#redistribute ospfv3 1 metric 10000 100 255 1 1500 R2(config-router-af-topology)#exit-af-topology

R2(config-router)#address-family ipv6 unicast autonomous-system 6

R2(config-router-af)#topology base

R2(config-router-af-topology)#redistribute ospf 1 metric 10000 100 255 1 1500 R2(config-router-af-topology)#exit-af-topology



1.12. En R2, de hacer publicidad de la ruta 192.168.3.0/24 a R1 mediante una lista de distribución y ACL.

R2

R2(config-router)# ip access-list standard R3-to-R1 R2(config-std-nacl)# remark ACL to filter 192.168.3.0/24 R2(config-std-nacl)# deny 192.168.3.0 0.0.0.255 R2(config-std-nacl)# permit any R2(config)# router ospfv3 1 R2(config-router)# address-family ipv4 unicast R2(config-router-af)# redistribute eigrp 4 R2(config-router-af)# address-family ipv6 unicast R2(config-router-af)# redistribute eigrp 6 R2(config-router-af)# exit-address-family

```
Figura 18. Una lista de distribución y ACL en R2
```

R2(config-router)# ip access-list standard R3-to-R1
R2(config-std-nacl)# remark ACL to filter 192.168.3.0/24
R2(config-std-nacl)# deny 192.168.3.0 0.0.0.255
R2(config-std-nacl)# permit any
R2(config-std-nacl)#
R2(config)# router ospfv3 1
R2(config-router)# address-family ipv4 unicast
R2(config-router-af)# redistribute eigrp 4
R2(config-router-af)# address-family ipv6 unicast
R2(config-router-af)# redistribute eigrp 6
R2(config-router-af)# exit-address-family
R2(config-router)# exit
R2 (config) #

1.13. Parte 2: Verificar conectividad de red y control de la trayectoria.

1.13.1. Registrar las tablas de enrutamiento en cada uno de los routers, acorde con los parámetros de configuración establecidos en el escenario propuesto.

R1# show ip route





R1# show ipv6 route



RI# snow ipv6 route
IPv6 Routing Table - default - 3 entries
Codes: C - Connected, L - Local, S - Static, U - Per-user Static route
B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
H - NHRP, II - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, la - LISP alt
<pre>lr - LISP site-registrations, ld - LISP dyn-eid, a - Application</pre>
C 2001:DB8:ACAD:110::/64 [0/0]
via Ethernet0/0, directly connected
L 2001:DB8:ACAD:110::1/128 [0/0]
via Ethernet0/0, receive
L FF00::/8 [0/0]
via NullO, receive
R1#

R2# show ip route

Figura 21. Comando show ip route en R2

*Dec 7 22:11:36.643: %SYS-5-CONFIG_I: Configured from console by console R2# 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, 1 = LISP a = application route + = replicated route, % = next hop override Gateway of last resort is not set 192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.2.0/24 is directly connected, Ethernet0/0 L 192.168.2.1/32 is directly connected, Ethernet0/0 R2#

R2# show ipv6 route



R2#	show ipv6 route
IPv6	Routing Table - default - 3 entries
Code	s: C - Connected, L - Local, S - Static, U - Per-user Static route
	B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
	H - NHRP, Il - ISIS Ll, I2 - ISIS L2, IA - ISIS interarea
	IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
	ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
	O - OSPF Intra, OI - OSPF Inter, OEl - OSPF ext 1, OE2 - OSPF ext 2
	ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, 1a - LISP alt
	lr - LISP site-registrations, ld - LISP dyn-eid, a - Application
С	2001:DB8:ACAD:B::/64 [0/0]
	via Ethernet0/0, directly connected
L	2001:DB8:ACAD:B::1/128 [0/0]
	via Ethernet0/0, receive
L	FF00::/8 [0/0]
_	via NullO, receive

R2# show ipv6 ospf

Figura 23. Comando show ipv6 ospf en R2



R3# show ip route

Figura 24. Comando show ip route en R3

*Dec 7 22:14:12.628: %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, 1 = LISP a = application route + = replicated route, % = next hop override Gateway of last resort is not set 192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks C 192.168.3.0/24 is directly connected, Ethernet0/0 L 192.168.3.1/32 is directly connected, Ethernet0/0 R3# show ipv6 route

|--|

R3#	show ipv6 route
IPv6	5 Routing Table - default - 3 entries
Code	es: C - Connected, L - Local, S - Static, U - Per-user Static route
	B - BGP, HA - Home Agent, MR - Mobile Router, R - RIP
	H - NHRP, I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea
	IS - ISIS summary, D - EIGRP, EX - EIGRP external, NM - NEMO
	ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect
	O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
	ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, 1a - LISP alt
	lr - LISP site-registrations, ld - LISP dyn-eid, a - Application
С	2001:DB8:ACAD:C::/64 [0/0]
	via Ethernet0/0, directly connected
L	2001:DB8:ACAD:C::1/128 [0/0]
	via Ethernet0/0, receive
L	FF00::/8 [0/0]
	via NullO, receive

R3# show ipv6 ospf

```
Figura 26. Comando show ipv6 ospf en R3
```

```
R3# show ipv6 ospf
Supports NSSA (compatible with RFC 3101)
Supports Database Exchange Summary List Optimization (RFC 5243)
Event-log enabled, Maximum number of events: 1000, Mode: cyclic
It is an autonomous system boundary router
Originate Default Route with always
Router is not originating router-LSAs with maximum metric
Initial SPF schedule delay 5000 msecs
Minimum hold time between two consecutive SPFs 10000 msecs
Maximum wait time between two consecutive SPFs 10000 msecs
LSA group pacing timer 240 secs
Interface flood pacing timer 33 msecs
Retransmission pacing timer 66 msecs
Number of external LSA 1. Checksum Sum 0x00788C
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
Graceful restart helper support enabled
Reference bandwidth unit is 100 mbps
RFC1583 compatibility enabled
```

1.13.2. Verificar comunicación entre routers mediante el comando ping y traceroute

R1# Ping 192.168.110.1

```
Figura 27. Ping 192.168.110.1 en R1
```

```
Rl# Ping 192.168.110.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.110.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/5/6 ms
```

R2# Ping 192.168.2.1

Figura 28. Ping 192.168.2.1 en R2

```
R2# ping 192.168.2.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.2.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/5/5 ms
R2#
```

R3# Ping 192.168.3.1

Figura 29. Ping 192.168.3.1 en R3

```
R3# ping 192.168.3.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.3.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/5/5 ms
R3#
```

1.13.3. Verificar que las rutas filtradas no están presentes en las tablas de enrutamiento de los routers correctas.

Nota: Puede ser que Una o más direcciones no serán accesibles desde todos los routers después de la configuración final debido a la utilización de listas de distribución para filtrar rutas y el uso de IPv4 e IPv6 en la misma red.

R1# show run

Figura 30. Verificar las rutas filtradas no presentes en R1



R2# show run

Figura 31. Verificar las rutas filtradas no presentes en R2

R2	₽ R2
ip address 192.168.2.1 255.255.255.0	router eigrp DUAL-STACK !
ospfv3 1 ipv6 area 1	address-family ipv4 unicast autonomous-system 4
ospfv3 l ipv4 area l	
	topology base
interface Ethernet0/1	distribute-list R3-to-R1 out
no ip address	redistribute ospfv3 1 metric 10000 100 255 1 150(
shutdown	exit-af-topology
1	network 192.168.9.0 0.0.0.3
interface Ethernet0/2	eigrp router-id 2.2.2.2
no ip address	exit-address-family
shutdown	
1	address-family ipv6 unicast autonomous-system 6
interface Ethernet0/3	
no ip address	af-interface Ethernet0/0
shutdown	shutdown
1	exit-af-interface
interface Ethernet1/0	
no ip address	af-interface Serial2/1
shutdown	shutdown
1	exit-af-interface
interface Ethernet1/1	
no ip address	topology base
shutdown	redistribute ospf 1 metric 10000 100 255 1 1500
	exit-af-topology
interface Ethernet1/2	eigrp router-id 2.2.2.2
no ip address	exit-address-family
shutdown	
:	router ospfv3 1
interface Ethernet1/3	
no ip address	address-family ipv4 unicast
Shucdown	redistribute eigrp 4
: interface Serial2/0	router-id 2.2.2.2
handwidth 128	area 1 stub no-summary
ip address 192.168.9.2 255.255.255.0	exit-address-family
ipv6 address 2001:DB8:ACAD:90::2/64	
serial restart-delay 0	address-family ipv6 unicast
1	redistribute eigrp 6
interface Serial2/1	router-id 2.2.2.2
bandwidth 128	area 1 stub no-summary
ip address 192.168.9.5 255.255.255.0	exit-address-family
shutdown	
ipv6 address 2001:DB8:ACAD:91::1/64	in forward-protocol nd

R3# show run

₽	P R3
interface Ethernet0/0 ip address 192.168.3.1 255.255.255.0	- !
ipv6 address 2001:DB8:ACAD:C::1/64	interface Serial3/0
ospfv3 1 ipv6 area 0	no ip address
ospfv3 l ipv4 area 0	snutdown
1	serial restart-delay u
interface Ethernet0/1	:
no ip address	interface Serials/1
shutdown	no ip address
1	snucdown
interface Ethernet0/2	Serial restart-delay 0
no ip address	: interface Serial2/2
shutdown	interiace Serials/2
! 	no ip address
interface EthernetU/3	snutdown
no ip address	Serial restart-delay 0
shutdown	: interface Serial2/2
: interface Ethernet1/0	inceriace Seriais/S
no ip address	abutdour
shutdown	sorial restart delay 0
1	Serial restart-delay o
interface Ethernet1/1	: router cenfu2 1
no ip address	I I I I I I I I I I I I I I I I I I I
shutdown	: addrees_family inv4 unicast
1	Desive_interface Fthernat0/0
interface Ethernet1/2	default_information originate always
no ip address	router-id 3 3 3 3
shutdown	avit_addrage_family
!	I I
interface Ethernet1/3	address-family inv6 unicast
no 1p address	passive_interface Fthernet0/0
snutdown	default-information originate always
: interface Serial2/0	router-id 3.3.3.3
no in address	evit-address-family
shutdown	I I
serial restart-delay 0	· in forward-protocol nd
!	I
interface Serial2/1	
bandwidth 128	no ip http server
ip address 192.168.9.6 255.255.255.0	no ip http secure-server
ipv6 address 2001:DB8:ACAD:91::2/64	1
ospfv3 l ipv6 area 0	

Figura 32. Verificar las rutas filtradas no presentes en R3

2. ESCENARIO 2

Una empresa de comunicaciones presenta una estructura Core acorde a la topología de red, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, etherchannels, VLANs y demás aspectos que forman parte del escenario propuesto.



Figura 33. Topología escenario 2

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



Figura 34. Simulación de escenario 2

2.2. Apagar todas las interfaces en cada switch

DLS1

DLS1# conf ter DLS1(config)# interface range e0/1-2 DLS1(config-if-range)# shutdown

Figura 35. Apagar i	interfaces	DLS1
---------------------	------------	------

```
DLS1# conf ter

Enter configuration commands, one per line. End with CNTL/2.

DLS1(config)# interface range e0-3/1-2

* Invalid input detected at '^' marker.

DLS1(config)# interface range e0/1-2

DLS1(config-if-range)# shutdown

DLS1(config-if-range)#

*Dec 6 20:25:44.865: %LINK-5-CHANGED: Interface Ethernet0/1, changed state to adm

*Dec 6 20:25:44.875: %LINK-5-CHANGED: Interface Ethernet0/2, changed state to adm

*Dec 6 20:25:45.870: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1,

DLS1(config-if-range)#

*Dec 6 20:25:45.877: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2,

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

DLS2

DLS2# conf ter DLS2(config)# interface range e0/1-2 DLS2(config-if-range)# shutdown

Figura 36. Apagar interfaces DLS2



ALS1

ALS1# conf ter ALS1(config)# interface range e0/1-2 ALS1(config-if-range)# shutdown

Figura 37. Apagar interfaces ALS1



ALS2

ALS2# conf ter ALS2(config)# interface range e0/1-2 ALS2(config-if-range)# shutdown

Figura 38. Apagar interfaces ALS2



2.3. Asignar un nombre a cada switch acorde al escenario establecido.

Switch# conf ter

Switch(config)# hostname DLS1, DLS2, ALS1, ALS2

DLS1(config) # hostname DLS1 DLS2(config) # hostname DLS2 DLS2(config) # hostname DLS2 ALS1(config) # hostname ALS1 ALS2(config) # hostname ALS1 ALS2(config) # hostname ALS2

Figura 39. Asignación nombres dispositivos

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

DLS1

DLS1# conf ter DLS1(config)# interface port-channel 12 DLS1(config-if)# no switchport DLS1(config-if)# ip address 10.12.12.1 255.255.255.252 DLS1(config-if)# exit DLS1(config)# interface range e1/1-2 DLS1(config-if-range)# no switchport DLS1(config-if-range)# channel-group 12 mode active DLS1(config-if-range)# exit DLS1(config)# exit

DLS2

DLS2# conf ter DLS2(config)#interface port-channel 12 DLS2(config-if)#no switchport DLS2(config-if)#ip address 10.12.12.2 255.255.255.252 DLS2(config-if)#exit DLS2(config)#interface range e1/1-2 DLS2(config-if-range)#no switchport DLS2(config-if-range)#channel-group 12 mode active DLS2(config-if-range)#exit

Figura 40. Conexión entre DLS1 y DLS2 será un EtherChannel capa-3 utilizando LACP

```
DLS1(config) # interface port-channel 12
DLS1(config-if) # no switchport
DLS1(config-if)#
*Dec 6 21:23:20.230: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-cha
DLS1(config-if) # exit
DLS1(config)# interface range fa0/11-12
% Invalid input detected at '^' marker.
DLS1(config)# interface range e1/1-2
DLS1(config-if-range)# no switchport
DLS1(config-if-range)#
*Dec 6 21:26:12.123: %LINK-3-UPDOWN: Interface Ethernetl/1, changed state to
*Dec 6 21:26:12.138: %LINK-3-UPDOWN: Interface Ethernet1/2, changed state to
*Dec 6 21:26:13.126: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet
DLS1(config-if-range)#
*Dec 6 21:26:13.146: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet
DLS1(config-if-range)# channel-group 12 mode active
DLS1(config-if-range)#exit
 LS2(config) # interface port-channel 12
DLS2(config-if) # no switchport
DLS2(config-if)#
*Dec 6 21:27:05.686: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel
DLS2(config-if)# exit
DLS2(config)# interface range el/1-2
DLS2(config-if-range)# no switchport
DLS2(config-if-range)#
*Dec 6 21:27:52.287: %LINK-3-UPDOWN: Interface Ethernetl/1, changed state to up
*Dec 6 21:27:52.297: %LINK-3-UPDOWN: Interface Ethernet1/2, changed state to up
*Dec 6 21:27:53.290: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1
*Dec 6 21:27:53.305: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2
DLS2(config-if-range)# channel-group 12 mode active
DLS2(config-if-range)# exit
DLS2 (config) #
```

Validando el estado del Etherchannel usamos el comando: show etherchannel Summary en cada uno de los swich.

DLS1# show etherchannel Summary
Figura 41. Comando show etherchannel summary en DLS1 y DLS2

12	Po12 (RU)	LACP	Et1/1(P)	Et1/2(P)		12	Pol2(RU)	LACP	Et1/1(P)	Et1/2(P)
Group +	Port-channel P	rotocol	Ports			Group	Port-channel		Ports	
Number Number	of channel-grou of aggregators:	ps in use:				Number Number	of channel-gro of aggregators	ups in use: ::		
	A - formed by	Auto LAG					A - formed by	Auto LAG		
	<pre>m - not in use m - not in use u - unsuitable w - waiting to d - default po</pre>	;, minimum J ;, port not : for bundli o be aggrega ort	aggregated ing ated	t due to minimum	links not met		M - not in us m - not in us u - unsuitabl w - waiting t d - default p	e, minimum . e, port not e for bundl. o be aggreg port	links hot me aggregated (ing ated	t due to minimu
	I - stand-alon H - Hot-standb R - Layer3 U - in use f - failed to	e s - suspe y (LACP on) S - Layer N - not i allocate ag	ended Ly) c2 in use, no a ggregator	ggregation		11095.	I - stand-alc H - Hot-stand R - Layer3 U - in use f - failed to	ne s - susp by (LACP on S - Laye N - not allocate a	ended ly) r2 in use, no a ggregator	ggregation
Flags:	D - down	P - bundl	led in port-	channel		DL52#	D - down	nei summary	led in port-	channal

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

DLS1

DLS1#conf ter DLS1(config)#int ran e3/1-2 DLS1(config-if-range)#switchport trunk encapsulation dot1q DLS1(config-if-range)#switchport mode trunk DLS1(config-if-range)#channel-group 1 mode active DLS1(config-if-range)#no shutdow

Figura 42. Port channel 1 DSL1

DLS1# conf ter Enter configuration commands, one per line. End with CNTL/2.	DLSI# : Flags:	now etherchann D - down I - stand-alc	P - bund P - bund	led in port- ended	-channel
DLS1(config) # int ran e3/1-2		H - Hot-stand	iby (LACP on	ly)	
DLS1(config-if-range) # switchport trunk encapsulation dotlq DLS1(config-if-range) # switchport mode trunk DLS1(config-if-range) # channel-group 1 mode active		R - Layer3 U - in use f - failed to	S - Laye: N - not : allocate a	r2 in use, no a ggregator	aggregation
Creating a port-channel interface Port-channel 1		M - not in us m - not in us	e, minimum : e, port not	links not m aggregated	et due to minimum
DLS1(config-if-range)#		u - unsuitabl	e for bundl:	ing	
*Dec 6 21:35:48.219: %LINEPROTO-5-UPDOWN: Line protocol on In	nte	d - default p	ort		
DLS1(config-if-range)#					
*Dec 6 21:35:53.639: %LINEPROTO-5-UPDOWN: Line protocol on In	nte	A - formed by	Auto LAG		
DLS1(config-if-range)#					
*Dec 6 21:35:55.102: %EC-5-L3DONTBNDL2: Et3/1 suspended: LACK *Dec 6 21:35:55.701: %EC-5-L3DONTBNDL2: Et3/2 suspended: LACK	? CNumber P _C Number	of channel-gro of aggregators	oups in use: ::		
DLS1(config-if-range)# no shutdown	Group	Port-channel	Protocol	Ports	
DLS1(config-if-range)#					
*Dec 6 21:39:31.009: %LINEPROTO-5-UPDOWN: Line protocol on In	ntei	Pol(SU)	LACP	Et3/1(P)	Et3/2(P)
DLS1(config-if-range) # exit	12 More	Pol2 (RŬ)	LACP	Et1/1(P)	Et1/2(P)

ALS1

ALS1(config)# int ran e3/1-2

ALS1(config-if-range)#switchport trunk encapsulation dot1q ALS1(config-if-range)#switchport mode trunk ALS1(config-if-range)#channel-group 1 mode active

ALS1(config-if-range)#no shutdown

Figura 43. Port channel 1 ALS1

ALSI# conf ter	
Enter configuration commands, one per line. End with CN	TL/Z
ALS1(config) # int ran e3/1-2	
ALS1(config-if-range) # switchport trunk encapsulation do	tlq
ALS1(config-if-range)# switchport mode trunk	
ALS1(config-if-range)# channel-group 1 mode active	
Creating a port-channel interface Port-channel 1	
ALS1(config-if-range)#	
*Dec 6 21:39:31.015: %LINEPROTO-5-UPDOWN: Line protocol	on
ALS1(config-if-range)# no shutdown	
ALS1(config-if-range)# exit	
ALS1 (config) #exit	
ALS1#	
*Dec 6 21:40:02.390: %SYS-5-CONFIG_I: Configured from c	onso
ALS1#show etherchannel Summary	
Flags: D - down P - bundled in port-channel	
1 - stand-alone s - suspended	
H - Hot-standby (LACP only)	
R - Layer3 S - Layer2	
U - in use N - not in use, no aggregation	
I - TAILed to allocate aggregator	
M - not in use, minimum links not met	
m - not in use, port not aggregated due to minim	um 1
u - unsuitable for bundling	
w - waiting to be aggregated	
d - default port	
A - formed by Auto LAG	
Number of channel-groups in use: 1	
Number of aggregators: 1	
Group Port-channel Protocol Ports	
1 EGI(50) EACE LUS/1(P) LUS/2(P)	

DLS2

DLS2(config)#int ran e3/1-2 DLS2(config-if-range)#switchport trunk encapsulation dot1q DLS2(config-if-range)#switchport mode trunk DLS2(config-if-range)#channel-group 2 mode active DLS2(config-if-range)#no shutdown Figura 44. Port channel 2 DSL2

DLS2(config) # int ran e3/1-2		
DLS2(config-if-range) # switchpor	t trunk enca	psulation dotlg
DLS2(config-if-range) # switchpor		
DLS2(config-if-range) # channel-g	roup 2 mode	
Creating a port-channel interface		
DLS2(config-if-range)#		
*Dec 6 21:44:50.664: %LINEPROTO		ine protocol on Interface Ethernet3/2, changed sta
DLS2(config-if-range)#		
*Dec 6 21:44:52.523: %LINEPROTO	-5-UPDOWN: I	ine protocol on Interface Ethernet3/2, changed sta
DLS2(config-if-range) # no shutdow		
DLS2(config-if-range)#		
*Dec 6 21:44:57.733: %EC-5-L3DO	NTBNDL2: Et3	3/2 suspended: LACP currently not enabled on the residue of the
*Dec 6 21:44:57.774: %EC-5-L3DO	NTBNDL2: Et3	i/1 suspended: LACP currently not enabled on the re
DLS2(config-if-range)# exit		
DLS2 (config) #exit		
DLS2#		
*Dec 6 21:45:14.781: %SYS-5-CON	FIG_I: Confi	gured from console by console
DLS2# show etherchannel Summary		
Flags: D - down P - bund.	led in port-	channel
I - stand-alone s - susp	ended	
H - Hot-standby (LACP on.	TÅ)	
R - Layer3 S - Laye	r2	
U - in use N - not :	in use, no a	ggregation
I - IAILED to Allocate a	ggregator	
M not in use minimum	linka nat ma	
m not in use, minimum.	aggregated	
m - not in use, poit not	aggregateu	ade co minimum links not met
w - waiting to be aggreg	ated	
d - default port		
a acraato poro		
A - formed by Auto LAG		
Number of channel-groups in use:		
Number of aggregators:		
Group Port-channel Protocol		
++++		
2 Po2 (SD) LACP		
12 Pol2 (RU) LACP		
More		

ALS2

ALS2(config)#int ran e3/1-2 ALS2(config-if-range)#switchport trunk encapsulation dot1q ALS2(config-if-range)#switchport mode trunk ALS2(config-if-range)#channel-group 2 mode active ALS2(config-if-range)#no shutdown

Figura 45. Portchannel 2 ALS2

ALS2 (co	nfiq)# int ran e	3/1-2			
ALS2 (CO	nfig-if-range)#	switchpor	t trunk enca	psulation dotlg	
ALS2 (CO	nfig-if-range)#s	witchport	mode trunk		
ALS2 (co	nfig-if-range)#	channel-q	roup 2 mode a	active	
Creatin	g a port-channel	interfac	e Port-chann	el 2	
ALS2 (co	nfig-if-range)#				
*Dec 6	21:48:30.348: %	LINEPROTO	-5-UPDOWN: L	ine protocol on Int	eı
ALS2 (co	nfig-if-range)#	no shutdo	wn		
ALS2 (co	nfig-if-range)#e	xit			
ALS2 (co	nfig) #exit				
ALS2#					
*Dec 6	21:48:40.130: %	SYS-5-CON	FIG I: Confi	gured from console	by
ALS2# s	how etherchannel	Summary			
Flags:	D – down	P - bund	led in port-	channel	
	I - stand-alone	s - susp	ended		
	H - Hot-standby	(LACP on	1v)		
	R - Layer3	S - Laye	r2		
	U - in use	N - not	in use, no a	ggregation	
	f - failed to a	llocate a	ggregator		
	M - not in use,	minimum	links not me		
	m - not in use,	port not	aggregated (due to minimum link	
	u - unsuitable	for bundl	ing		
	w - waiting to	be aggreg	ated		
	d - default por				
	A - formed by A	uto LAG			
Number	of channel-group	s in use:			
Number	of aggregators:				
Group	Port-channel Pr		Ports		
+					
2	Po2 (SU)	LACP	Et3/1(P)	Et3/2(P)	

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

DLS1

DLS1(config)#int ran e2/1-2

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

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

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

DLS1(config-if-range)#no shutdown

Figura 46. Port channel 4 DSL1

DLSI# Conf ter								
Enter configuration commands, one per line. End with CNTL/Z.								
DLS1(config)‡ int ran e2/1-2								
DLS1(config-if-range)								
DLS1(config-if-range)								
DLS1(config-if-range)# channel-group 4 mode desirable								
Creating a port-channel interface Port-channel 4								
DLS1(config-if-range)#								
*Dec 6 21:52:26.851: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ether								
DLS1(config-if-range)#								
*Dec 6 21:52:32.787: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ether								
DLS1(config-if-range) # no shutdown								
DLS1(config-if-range)#								
*Dec 6 21:54:54.614: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-								
DLS1(config-if-range)								
Number of channel-groups in use: 3								
Number of aggregators: 3								
Group Port-channel Protocol Ports								
1 Pol(SU) LACP Et3/1(P) Et3/2(P)								
4 Po4(SU) PAgP Et2/1(P) Et2/2(P)								
12 Pol2(RU) LACP Et1/1(P) Et1/2(P)								
DLS1#								

ALS2

ALS2(config)#int ran e2/1-2 ALS2(config-if-range)# switchport trunk encapsulation dot1q ALS2(config-if-range)# switchport mode trunk ALS2(config-if-range)#channel-group 4 mode desirable ALS2(config-if-range)#no shutdown

Figura 47. Port channel 4 ALS2

```
ALS2# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)# int ran e2/1-2
ALS2(config-if-range) # switchport trunk encapsulation dotlq
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)# channel-group 4 mode desirable
ALS2(config-if-range)# no shutdown
ALS2(config-if-range)# exit
ALS2 (config) #exit
Number of channel-groups in use: 2
Number of aggregators:
Froup Port-channel Protocol Ports
                        LACP
                                                 Et3/2(P)
                        PAgP
                                                 Et2/2(P)
 LS2#
```

DLS1

DLS1(config)#int ran e2/1-2 DLS1(config-if-range)# switchport trunk encapsulation dot1q DLS1(config-if-range)# switchport mode trunk DLS1(config-if-range)#channel-group 4 mode desirable DLS1(config-if-range)#no shutdown

Figura 48 Port channel 4 DSL1

DLS1# cont	f ter			
Enter cont	figuration commands,	, one per line.	End with CNTL/	Ζ.
DLS1 (confi	ig)# int ran e2/1-2			
DLS1 (confi	ig-if-range)# switcl	nport trunk enca	psulation dotlq	
DLS1 (confi	ig-if-range)# switc]	nport mode trunk		
DLS1 (confi	ig-if-range)# channe	el-group 4 mode	desirable	
Creating a	a port-channel inter	rface Port-chann	el 4	
DLS1 (conf:	ig-if-range)#			
*Dec 6 21	1:52:26.851: %LINEP	ROTO-5-UPDOWN: I	ine protocol on	Interface Ethernet2
DLS1 (confi	ig-if-range)#			
*Dec 6 21	1:52:32.787: %LINEP	ROTO-5-UPDOWN: I	ine protocol on	Interface Ethernet2
DT 01 / 6				
Number	of channel-gro	oups in use:	з	
Number	of aggregators		3	
Group	Port-channel	Protocol	Ports	
1	Pol(SU)	LACP	Et3/1(P)	Et3/2(P)
4	Po4 (SU)	PAgP	Et2/1(P)	Et2/2(P)
12	Po12(RU)	LACP	Et1/1(P)	Et1/2(P)
_				

ALS2

ALS2(config)#int ran e2/1-2 ALS2(config-if-range)# switchport trunk encapsulation dot1q ALS2(config-if-range)# switchport mode trunk ALS2(config-if-range)#channel-group 4 mode desirable ALS2(config-if-range)#no shutdown

Figura 49. Port channel 4 ALS2

```
ALS2# conf ter

Enter configuration commands, one per line. End with CNTL/2.

ALS2(config) # int ran e2/1-2

ALS2(config-if-range) # switchport trunk encapsulation dotlq

ALS2(config-if-range) # switchport mode trunk

ALS2(config-if-range) # channel-group 4 mode desirable

ALS2(config-if-range) # no shutdown

ALS2(config-if-range) # exit

ALS2(config) # exit

ALS2 (config) # ex
```

DLS2

DLS2(config)#int ran e2/1-2 DLS2(config-if-range)# switchport trunk encapsulation dot1q DLS2(config-if-range)# switchport mode trunk DLS2(config-if-range)#channel-group 3 mode desirable DLS2(config-if-range)#no shutdown

Figura 50. Port channel 3 DSL2

DLS2# conf	ter			
Enter conf	iguration commands, (one per line.	End with CNTL/	Ζ.
DLS2 (confi	g)# int ran e2/1-2			
DLS2 (confi	g-if-range)# switchp	ort trunk enca	apsulation dotlq	
DLS2 (confi	g-if-range)#switchpo:	rt mode trunk		
DLS2 (confi	g-if-range)# channel	-group 3 mode	desirable	
Creating a	port-channel interf	ace Port-chani	nel 3	
DLS2 (confi	g-if-range)#			
*Dec 6 22	:13:41.195: %LINEPRO	TO-5-UPDOWN: 1	Line protocol on	Interface Ethernet2/1,
DLS2 (confi	g-if-range)#			
*Dec 6 22	:13:42.504: %LINEPRO	TO-5-UPDOWN: 1	Line protocol on	Interface Ethernet2/1,
DLS2/confi	a-if-range)# no shut	doum		
Number o	of channel-group	os in use:	3	
Number o	of aggregators:			
Group I	Port-channel Pr	otocol	Ports	
2 1		LACP	Et3/1(P)	Et3/2(P)
з і	Po3 (SU)	PAgP	Et2/1(P)	Et2/2(P)
12 1	Po12(RU)	LACP	Et1/1(P)	Et1/2(P)
DLS2#				

ALS1

ALS1(config)#int ran e2/1-2 ALS1(config-if-range)# switchport trunk encapsulation dot1q ALS1(config-if-range)# switchport mode trunk ALS1(config-if-range)#channel-group 3 mode desirable ALS1(config-if-range)#no shutdown

Figura 51. Portchannel 3 ALS1

```
ALS1# conf ter
Enter configuration commands, one per line. End with CNTL/2.
ALS1(config) # int ran e2/1-2
ALS1(config-if-range)# switchport trunk encapsulation dotlq
ALS1(config-if-range)# switchport mode trunk
ALS1(config-if-range)# channel-group 3 mode desirable
Creating a port-channel interface Port-channel 3
ALS1(config-if-range)#
Number of channel-groups in use: 2
Number of aggregators:
Group Port-channel Protocol Ports
      Pol(SU)
                     LACP
                                Et3/1(P)
                                          Et3/2(P)
      Po3(SU)
                      PAgP
                                            Et2/2(P)
LS1#
```

2.4.4. Todos los puertos troncales serán asignados a la VLAN 800 como la VLAN nativa.

Para validar que puertos son troncales usamos el siguiente comando en cada uno de los switches:

DLS1#show interfaces trunk



Figura 52 Verificación puertos Trunk DLS1

Luego usamos el siguiente comando para asignar la vlan 800 como vlan nativa para todos los puertos troncales en todos los Switches, en nuestro caso son la inerfaces que pertenecen a los pot-channel 1, 2, 3 y 4.

DLS1

DLS1#conf ter DLS1(config)#interface Po1 DLS1(config-if)#switchport trunk native vlan 800 DLS1(config-if)#exit DLS1(config)#interface Po4 DLS1(config-if)#switchport trunk native vlan 800 DLS1(config-if)#exit Figura 53. Configuración vlan 800 como vlan nativa DLS1



DLS2

DLS2(config)#interface Po2 DLS2(config-if)#switchport trunk native vlan 800 DLS2(config-if)#exit DLS2(config-if)#interface Po3 DLS2(config-if)#switchport trunk native vlan 800 DLS2(config-if)#exit

Figura 54. Configuración vlan 800 como vlan nativa DLS2

```
DLS2# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
DLS2(config) # interface Po2
DLS2(config-if) # switchport trunk native vlan 800
VLAN id 800 not found in current VLAN configuration
VLAN id 800 not found in current VLAN database
DLS2(config-if)#
*Dec 6 22:39:37.432: %CDP-4-NATIVE VLAN MISMATCH: Native VLAN mismatch d:
DLS2(config-if)# exit
DLS2(config) # interface Po3
DLS2(config-if) # switchport trunk native vlan 800
VLAN id 800 not found in current VLAN configuration
VLAN id 800 not found in current VLAN database
DLS2(config-if) # exit
DLS2(config) # exit
DLS2#
LS2# show interface trunk
                        Encapsulation Status Native vlan
802.lq trunking 800
802.lq trunking 800
         Mode
      Vlans allowed on trunk
          1-4094
          Vlans allowed and active in management domain
          Vlans in spanning tree forwarding state and not pruned
202
203
```

ALS1

ALS1(config-if)#interface Po1 ALS1(config-if)#switchport trunk native vlan 800 ALS1(config-if)#exit ALS1(config)#interface Po3

ALS1(config-if)#switchport trunk native vlan 800

ALS1 (config) # ALS1(config-if)# *Dec 6 22:43:43.644: %CDP-4-NATIVE VLAN MISMATCH: Native VI S1 Ethernet3/1 (800). ALS1(config-if)#switchport trunk native vlan 800 VLAN id 800 not found in current VLAN configuration VLAN id 800 not found in current VLAN database ALS1(config)# interface Po3 ALS1(config-if)# ALS1(config-if)# *Dec 6 22:44:26.126: %CDP-4-NATIVE_VLAN MISMATCH: Native VI ALS1(config-if)# switchport trunk native vlan 800 VLAN id 800 not found in current VLAN configuration VLAN id 800 not found in current VLAN database ALS1 (config-if) #exit ALS1# show interface trunk Encapsulation Status Native vlan 802.lq trunking 800 802.lq trunking 800 Po1 Po3 Port Po3 1-4094 Port Vlans allowed and active in management domain Pol Po3 Vlans in spanning tree forwarding state and not pruned Port Pol Po3

Figura 55. Configuración vlan 800 como vlan nativa ALS1

ALS2

ALS2(config)#interface Po2 ALS2(config-if)#switchport trunk native vlan 800 ALS2(config-if)#interface Po4 ALS2 (config-if)#switchport trunk native vlan 800

Figura 56. Configuración vlan 800 como vlan nativa ALS2

ALS2# con	if ter			
Enter con	figuration con	mmands, one	per line. 1	End with CNTL
ALS2 (conf	ig)# interface	e Po2		
ALS2 (conf	ig-if)#			
*Dec 6 2	2:46:21.325:	CDP-4-NATIV	e_vlan_mism	ATCH: Native
S1 Ethern	net2/1 (800).			
ALS2 (conf	ig-if) # switcl	hport trunk	native vlan	800
*Dec 6 2	2:46:25.472:	CDP-4-NATIV	e_vlan_mism	ATCH: Native
52 Ethern	1et3/2 (800).			
AL52 (CONI	lg-11) # Switch	nport trunk	native vian	800
VLAN 10 0	00 not found :	in current v	LAN CONFIGU	Facion
ALS2 (conf	ig-if)#	in currenc v	LAN UACADAS	
*Dec 6 2	2:46:26.942:	SCDP-4-NATIV	E VLAN MISM	ATCH: Native
S2 Ethern	net3/1 (800).			
ALS2 (conf	iq-if)# exit			
ALS2 (conf	ig) # interface	e Po4		
ALS2 (conf	ig-if)#			
*Dec 6 2	2:46:42.847:	CDP-4-NATIV	E_VLAN_MISM	ATCH: Native '
S1 Ethern	net2/2 (800).			
ALS2 (conf	ig-if)# switcl	hport trunk :	native vlan	800
VLAN id 8	00 not found :	in current V	LAN configu	ration
VLAN id 8	300 not found :	in current V	LAN databas	e
ALS2 (conf	ig-if) #exit			
MS2 (cert				
ALS2# show :	interface trunk			
Port	Mode	Encapsulation	Status	Native vlan
Po2	on	802.lq	trunking	800
Do4	07	802 10	trunking	800
F01	on	002.14	crunking	000
Port	Vlans allowed on	trunk		
	1 4004			
Poz	1-4094			
Po4	1-4094			
Port	Vlans allowed and	d active in man	agement domain	
Po2				
Po4				
Dame	Warne de constant			
POIL	vians in spanning	g tree forwardi	ng state and n	ot prunea
Po2				
Po4				
P04				
ALS2#				

- 2.5. Configurar DLS1, ALS1, y ALS2 para utilizar VTP versión 2
- 2.5.1. Utilizar el nombre de dominio UNAD con la contraseña cisco123

DLS1

DLS1(config)#vtp domain UNAD DLS1(config)#vtp pass cisco123 DLS1(config)#vtp version 2 DLS1# exit

Figura 57. Configuración DLS1 para utilizar VTP versión 2

DLS1# conf ter Enter configuration commands, one per line. End with CNTL/2. DLS1(config)# vtp domain UNAD Changing VTP domain name from NULL to UNAD DLS1(config)# vtp pass ciscol23 Setting device VTP password to ciscol23 DLS1(config)# vtp version 2 DLS1(config)# exit DLS1#

ALS1

ALS1# conf ter ALS1(config)# vtp domain UNAD ALS1(config)# vtp pass cisco123 ALS1(config)# vtp version 2 ALS1# exit

Figura 58. Configuración ALS1 para utilizar VTP versión 2

```
ALS1# conf ter
Enter configuration commands, one per line. End with CNTL/2
ALS1(config)# vtp domain UNAD
Changing VTP domain name from NULL to UNAD
ALS1(config)# vtp pass ciscol23
Setting device VTP password to ciscol23
ALS1(config)# vtp version 2
ALS1(config)# exit
ALS1#
```

ALS2

ALS2(config)#vtp domain UNAD ALS2(config)#vtp pass cisco123 ALS2(config)#vtp version 2

Figura 59. Configuración ALS2 para utilizar VTP versión 2

```
ALS2# conf ter
Enter configuration commands, one per line. End with CNTL/Z.
ALS2(config)# vtp domain UNAD
Changing VTP domain name from NULL to UNAD
ALS2(config)# vtp pass ciscol23
Setting device VTP password to ciscol23
ALS2(config)# vtp version 2
ALS2(config)# exit
ALS2#
```

2.5.2. Configurar DLS1 como servidor principal para las VLAN.

DLS1

DLS1# conf ter DLS1(config)# vtp mode server



DLS1# conf ter	
Enter configuration commands	, one per line. End with CNTL/Z.
DLS1(config) # vtp mode serve	r
Device mode already VTP Serv	er for VLANS.
eren er it i Torrada	
DLS1# show vtp status	
VTP Version capable :	1 to 3
VTP version running :	2
VTP Domain Name :	UNAD
VTP Pruning Mode :	Disabled
VTP Traps Generation :	Disabled
Device ID :	aabb.cc80.0100
Configuration last modified by 10.	12.12.1 at 12-6-19 22:52:32
Local updater ID is 10.12.12.1 on	interface Pol2 (first layer3 interface found
Fosture VI AN.	
reactive view.	
VTP Operating Mode	: Server
Maximum VLANs supported locally	: 1005
Number of existing VLANs	: 5
Configuration Revision	: 1
MD5 digest	: 0x74 0x38 0x1B 0x2E 0x93 0x1B 0x0C 0x1F
	0xF5 0x0C 0xB7 0x2B 0xB8 0x02 0x2F 0xD1
*** MD5 digest checksum mismatch o	n trunk: Pol ***
*** MD5 digest checksum mismatch c	n trunk: Po4 ***

2.5.3. Configurar ALS1 y ALS2 como clientes VTP

ALS1

ALS1# conf ter ALS1(config)# vtp mode client ALS1(config)# exit

Figura 61. Configurar ALS1 como cliente

ALS2

ALS2# conf ter ALS2(config)# vtp mode client ALS2(config)# exit

Figura 62. Configurar ALS2 como cliente

```
ALS2# conf ter
Enter configuration commands, one per line. End with CNTL/2.
ALS2 (config) #
ALS2(config) #vtp mode client
Setting device to VTP Client mode for VLANS.
ALS2(config)# exit
*Dec 6 23:07:46.518: %SYS-5-CONFIG I: Configured from console by console
VTP Version capable
TP version running
                                 : 2
: UNAD
VTP Pruning Mode
Configuration last modified by 0.0.0.0 at 12-6-19 22:56:49
Feature VLAN:
                                    : Client
Maximum VLANs supported locally
Number of existing VLANs
Configuration Revision
                                    : 0x4D 0xAl 0x6D 0x0F 0x56 0x8B 0xC0 0xFl
0xBE 0x43 0x9F 0x1A 0x8D 0xCC 0xDA 0x2A
MD5 digest
```

2.6. Configurar en el servidor principal las siguientes VLAN:

Número de VLAN	Nombre de VLAN	Número de VLAN	Nombre de VLAN
800	NATIVA	434	ESTACIONAMIENTO
12	EJECUTIVOS	123	MANTENIMIENTO
234	HUESPEDES	1010	VOZ
1111	VIDEONET	3456	ADMINISTRACIÓN

DLS1

DLS1#conf ter

DLS1(config)# vlan 800

DLS1(config-vlan)# name NATIVA

DLS1(config-vlan)# vlan 12

DLS1(config-vlan)# name EJECUTIVOS

DLS1(config-vlan)# vlan 234

DLS1(config-vlan)# name HUESPEDES

DLS1(config-vlan)# vlan 1111

DLS1(config-vlan)# name VIDEONET

DLS1(config-vlan)# vlan 434

DLS1(config-vlan)# name ESTACIONAMIENTO

DLS1(config-vlan)# vlan 123

DLS1(config-vlan)# name MANTENIMIENTO

DLS1(config-vlan)# vlan 1010

DLS1(config-vlan)# name VOZ

DLS1(config-vlan)# vlan 3456

DLS1(config-vlan)# name ADMINISTRACION

DLS1(config-vlan)# exit

Figura 63. Configuración Vlan en DLS1

	DLS1#	conf te	r								
	Enter	configu	ratio	on com	mands,	one p	per 3	line.	End v	vith	CNTL/Z.
	DLS1 ((config)#	vlar	1 800							
	DLS1 (config-v	lan) #	name i	NATIV	'A					
	DLS1 (config-v	lan) ‡	vlan	12						
	DLS1 (config-v	lan) ‡	name	EJECU	TIVOS					
	DLS1	config-v	lan) ±	vlan	234						
	DLS1	config-v	lant	t name	HIFSE	RDES					
	DISL	config-v	1 2 2 1 2 2 1 2 2 2	- manac	1111	1010					
	DISI	config-v	lan) +	, vian	VIDEC	MET					
	DIGI	config-v	1 +		424	ANE. I					
	DIGI	(config-v	Tan) #	- vian	131	TONAM	T TO AT TO	~			
	DEST ((conrig-v	Ian) #	i name	LOIAC	.TONAM	LENI	0			
	DESI (conrig-v	Tan) #	vian	123						
	DLSI (config-v	lan) #	name	MANTE	NIMIEI	OTO				
	DLS1 ((config-v	lan)‡	vlan	1010						
	DLS1 ((config-v	lan)‡	name	voz						
	DLS1 ((config-v	lan)#	vlan	3456						
	DLS1 ((config-v	lan)#	‡ name	ADMIN	IISTRA	CION				
	DLS1 ((config-v	lan)#	EXIT							
	DLS1 ((config)#	EXII								
DLS1;	show	vlan									
DLS1	\$ show	vlan									
dls1; vlan	show Name	vlan			Stat	us Po	orts				
DLS1; VLAN	show Name	vlan			Stat	us Po	orts	7-0(1)			
DLS1; VLAN 1	\$ show Name defaul	vlan 			Stat acti	us Po ve Et Ft	orts 	Et0/1, 1	Et0/2, 1	 Et0/3	
DLS1; VLAN 1	f show Name defaul	vlan Lt			Stat acti	us Po ve Et Et Ft	orts t0/0, t1/0, t3/0.	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	 Et0/3 Et2/3	
DLS1 VLAN 1 12	f show Name defaul EJECUI	vlan Lt			Stat acti acti	us Po ve Et Et Ve	orts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1 VLAN 1 12 123	show Name defaul EJECUI MANTEN	vlan Lt FIVOS NIMIENTO			Stat acti acti acti	us Po ve Ei Ei ve ve	brts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	 Et0/3 Et2/3	
DLS1 1 12 123 234	show Name defaul EJECUI MANTEN HUESPE	vlan Lt TIVOS NIMIENTO EDES			Stat acti acti acti acti acti	us Po ve Et Et ve ve ve ve	brts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1; VLAN 1 12 123 234 434	show Name defaul EJECUI MANTEN HUESPE ESTACI	vlan Lt TIVOS NIMIENTO EDES IONAMIENTO			Stat acti acti acti acti acti acti	us Po Ve Et Et Ve Ve Ve Ve Ve	brts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1; VLAN 1 12 123 234 434 800	show Name defaul EJECUI MANTEN HUESPE ESTACI NATIVA	vlan Lt TIVOS NIMIENTO EDES IONAMIENTO			Stat acti acti acti acti acti acti	us Po ve Et Et ve ve ve ve ve ve	orts 10/0, 1/0, 53/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1 VLAN 1 12 123 234 434 800 1002	show Name defaul EJECUI MANTEN HUESPF ESTACI NATIVZ fddi-o	vlan Lt NIMIENTO DES LONAMIENTO A Befault			Stat acti acti acti acti acti acti	us Po Ve Et Et Ve Ve Ve ve ve ve ve ve ve unsup	brts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1 VLAN 1 12 123 234 434 800 1002 1003 1004	show Name defaul EJECUT MANTEN HUESPE ESTACI NATIVZ fddi-c trorf- fddi-c	vlan Lt TIVOS NIMIENTO CDES CONAMIENTO A default -default t-default			Stat acti acti acti acti acti acti act/ act/ act/	us Po ve Et Et ve ve ve ve unsup unsup unsup	brts 50/0, 51/0, 53/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1; VLAN 1 12 123 234 434 800 1002 1003 1004 1005	show Name defaul EJECUT MANTEN HUESPE ESTACI NATIVZ fddi-c trorf- fddine trbrf-	vlan It TIVOS NIMIENTO EDES CONAMIENTO A default -default -default			Stat acti acti acti acti acti acti act/ act/ act/ act/ act/	us Po ve Et Et ve ve ve ve unsup unsup unsup unsup	brts 50/0, 51/0, 53/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1; VLAN 1 12 123 234 434 800 1002 1003 1004 1005 1010	* show Name defaul EJECUI MANTEN HUESPE ESTACI ESTACI ESTACI NATIVZ fddi-c trorf- fddine trbrf- VOZ	vlan It TIVOS NIMIENTO EDES CONAMIENTO A iefault -default -default -default			Stat acti acti acti acti acti acti act/ act/ act/ act/ act/ act/	us Po ve Et Et Ve ve ve ve unsup unsup unsup unsup unsup ve	borts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1 VLAN 1 12 123 234 434 800 1002 1003 1004 1005 1010 1111	* show Name defaul EJECUI MANTEN HUESPE ESTACI ESTACI ESTACI ESTACI CTCrf- fddine trCrf- fddine trDrf- VOZ VIDE <u>ON</u>	vlan It TIVOS NIMIENTO EDES CONAMIENTO A default -default -default -default -default			Stat acti acti acti acti acti acti act/ act/ act/ act/ act/ acti	us Po Ve Et Ve Ve Ve ve unsup unsup unsup unsup ve ve ve ve ve ve ve ve ve ve ve ve ve	borts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1; VLAN 1 12 123 234 434 800 1002 1003 1004 1005 1010 1111 3456	* show Name defaul EJECUI MANTEN HUESPE ESTACI NATIVA fddi-c trorf- fddine trbrf- VOZ VIDEON ADMINI	vlan It TIVOS NIMIENTO EDES IONAMIENTO A default -default -default -default -default NET ISTRACION			Stat acti acti acti acti acti acti act/ act/ act/ act/ acti acti acti	us Po ve Et Et ve ve ve unsup unsup unsup ve ve ve ve ve ve ve ve ve ve	orts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1 Et2/0, 1	Et0/3 Et2/3	
DLS1; VLAN 1 12 123 234 434 800 1002 1003 1005 1005 1010 1111 3456	show Name defaul EJECUI MANTEN HUESPH ESTACI NATIVA fddi-c trcrf- fddine trbrf- VOZ VIDEON ADMINI	vlan It TIVOS NIMIENTO EDES IONAMIENTO A default -default -default -default NET ISTRACION			Stat acti acti acti acti acti acti acti a	us Po ve Et Et ve ve ve unsup unsup unsup ve ve unsup ve ve ve unsup ve ve ve unsup	orts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3	Et0/2, 1	Et0/3 Et2/3	
DLS1: VLAN 1 12 123 234 434 800 1002 1003 1004 1005 1010 1111 3456 VLAN	show Name defaul EJECUI MANTEN HUESPH ESTACI NATIVY fddic trcrf- fddine trbrf- VOZ VIDEON ADMINI Type	vlan It TIVOS NIMIENTO CDES IONAMIENTO A default -default -default -default NET ISTRACION SAID	MTU	Parent	Stat acti acti acti acti acti acti act/ act/ act/ acti acti acti	us Po ve Et Et Ve ve ve unsup unsup unsup ve ve ve ve ve ve ve ve ve ve ve unsup ve ve ve unsup unsup ve ve ve ve ve ve ve ve ve ve ve ve ve	orts t0/0, t1/0, t3/0,	Et0/1, 1 Et1/3, 1 Et3/3 BrdgMo	Et0/2, 1 Et2/0, 1 de Tran:	SI Tra	ans2
DLS14 VLAN 1 1 2234 434 434 800 1002 1003 1004 1005 1010 3456 VLAN 	show Name defaul EJECUI MANTEN HUESPE ESTACI NATIVZ fddi-c trorf- fddine trorf- fddine trorf- fddine Type enet	vlan TIVOS VIMIENTO CDES IONAMIENTO A default -default -default ISTRACION SAID 	MTU 1500	Parent	Stat acti acti acti acti acti acti acti a	us Pa ve Et Et Ve ve ve unsup unsup unsup unsup ve ve ve ve ve ve unsup	orts t0/0, t1/0, t3/0, o Stp	Et0/1, 1 Et1/3, 1 Et3/3 BrdgMo	e Tran.	sl Tra	ans2
DLS14 VLAN 1 1 234 434 800 1002 1003 1004 1005 1010 3456 VLAN 1 1 2	show Name defaul EJECUI MANTEN HUESPE ESTACI NATIVZ fddine trorf- fdDine trorf- fdDine trorf- fdDine trorf- fdDine trorf- fdDine trorf- fdDine trorf- fdDine trorf- fdDine trorf- fdDine fdDine f fdDine f fdDine f fdDine f f fdDine f f f f f f f f f f f f f f f f f f f	vlan TIVOS VIMIENTO CDES IONAMIENTO A default -default -default NET ISTRACION SAID 	MTU 1500	Parent 	Stat acti acti acti acti acti acti acti a	us Pa ve Et Ve ve ve unsup unsup unsup unsup ve ve SridgeNa	orts t0/0, t1/0, t3/0, o Stp 	Et0/1, 1 Et1/3, 1 Et3/3 BrdgMod	de Tran:	sl Tra	ans2

2.7. En DLS1, suspender la VLAN 434.

DLS1

DLS1# conf ter DLS1(config)# vlan 434 DLS1(config-vlan)# state suspend DLS1(config-vlan)# exit

DLS1 Enter DLS1 DLS1 DLS1 DLS1	DLS1# conf ter Enter configuration commands, one per line. End with CNTL/Z. DLS1(config)# vlan 434 DLS1(config-vlan)# state suspend DLS1(config-vlan)# exit DLS1(config)# exit DLS1(config)# exit									
*Dec	500 6 23-29-48 528- \$5V5_5_CONFTC T	• Configure	ad from console by console							
DLS1#	0 23.29.40.320. \$313-3-CONFIG_1	. Configure	ed from console by console							
D1017										
VLAN	Name	Status	Ports							
1	default	active	Et0/0, Et0/1, Et0/2, Et0/3 Et1/0, Et1/3, Et2/0, Et2/3 Et3/0, Et3/3							
12	EJECUTIVOS	active								
123	MANTENIMIENTO	active								
234	HUESPEDES	active								
434	ESTACIONAMIENTO	suspended								
800	NATIVA	active								
1002	fddi-default	act/unsup								
1003	trcrf-default	act/unsup								
1004	fddinet-default	act/unsup								
1005	trbrf-default	act/unsup								
1010	VOZ	active								
1111	VIDEONET	active								
3456	ADMINISTRACION	active								

Figura 64. Evidencia comando state suspend

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

DLS2

DLS2#conf ter DLS2(config)# vtp mode transparent DLS2(config) vtp version 2 DLS2(config)# vlan 800 DLS2(config-vlan)# name NATIVA DLS2(config-vlan)# vlan 12 DLS2(config-vlan)# name EJECUTIVOS DLS2(config-vlan)# vlan 234 DLS2(config-vlan)# vlan 234 DLS2(config-vlan)# vlan 1111 DLS(config-vlan)# vlan 1111 DLS(config-vlan)# name VIDEONET DLS2(config-vlan)# vlan 434 DLS2(config-vlan)# vlan 434 DLS2(config-vlan)# vlan 434 DLS2(config-vlan)# name MANTENIMIENTO DLS2(config-vlan)# vlan 1010 DLS2(config-vlan)# name VOZ DLS2(config-vlan)# vlan 3456 DLS2(config-vlan)# name ADMINISTRACION DLS2(config-vlan)# exit

Figura 65. Configuración mode transparent para Vlan en DLS2

DLS2# conf ter											
Enter configuration commands, one per line. End with CNTL/Z.											
DLS2 (config) # vtp mode transparent											
Setting device to VTP Transparent mode for VLANS.											
DLS2(config)#	vtp ver	sion 2									
DLS2(config)#	vlan 80	0									
DLS2 (config-vl	DLS2 (config-vlan) # name NATIVA										
DLS2 (config-vl	DLS2(config-vlan) # vlan 12										
DLS2 (config-vl	an) # na	me EJH	CUTIV	os							
DLS2 (config-vl	an)# vl	an 234	£								
DLS2 (config-vl	an) # na	me HUI	SPEDE								
DLS2 (config-vl	an)# vl	an 111	11								
DLS2 (config-vl	an) # na	me VII	DEONET								
DLS2 (config-vl	an)# vl	an 434	£								
DLS2 (config-vl	an) # na	me ES1	PACION	AMIENT	ro						
DLS2 (config-vl	an)# vl	an 123									
DLS2 (config-vl	an) # na	me MAI	ITENIM	IIENTO							
DLS2 (config-vl	an)# vl	an 101	10								
DLS2 (config-vl	an) # na	me VO2	z								
DLS2 (config-vl	an)# vl	an 345	56								
DLS2 (config-vl	an) # na	me ADN	4INIST	RACION							
DLS2 (config-vl	an) # ex	it									
DLS2(config)#	exit										
DLS2# show vlan											
VLAN Name			Stat	tus P	Ports						
VLAN Name			Stat	tus P 	orts						
VLAN Name l default			Stat	tus P ive E	?orts 		:0/2. Et(
VLAN Name l default			Stat act:	tus P ive E F	Ports	Et0/1, Et	:0/2, Et()/3 2/3			
VLAN Name l default			Stat act:	tus P ive E E F	Ports 2t0/0, 2t1/0,	Et0/1, Et Et1/3, Et	:0/2, Et(:2/0, Et2	0/3 2/3			
VLAN Name 			Stat	tus P ive E E E	Ports 20/0, 20/0, 20/0, 20/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(:2/0, Et2	0/3 2/3			
VLAN Name 			Stat act: act:	tus P ive E E E	Ports 20/0, 20/0, 20/0, 20/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(:2/0, Et;)/3 2/3			
VLAN Name 			Stat act: act: act:	tus P ive E E ive ive	Ports 2t0/0, 2t1/0, 2t3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(:2/0, Et2)/3 2/3			
VLAN Name 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES			Stat act: act: act: act:	tus P E ive E E ive ive ive	Ports 2007 2000, 2	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(:2/0, Et2)/3 2/3			
VLAN Name l default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN	 ro		Stat act: act: act: act: act:	tus P E E E ive ive ive ive	Ports 2007 2000, 2	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(:2/0, Et;)/3 2/3			
VLAN Name 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA	ro		Stat act: act: act: act: act: act:	tus P ive E ive E ive ive ive ive ive ive	Ports 2000, 200, 2000, 2	Et0/1, Et Et1/3, Et Et3/3	0/2, Et(2/0, Et	0/3 2/3			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default	 ro		Stat act: act: act: act: act: act: act: a	tus P ive E ive ive ive ive ive ive ive	Ports 2000, 200, 2000, 2	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(2/0, Et	2/3 2/3			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default			Stat act: act: act: act: act: act: act;	tus P ive E ive E ive ive ive ive /unsup /unsup	Ports t0/0, t1/0, t3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(2/0, Et)	0/3 2/3			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 fcrcf-default 1004 fddinet-defau	ro 1t		Stat act: act: act: act: act: act; act, act,	tus P ive E ive ive ive ive ive /unsup /unsup /unsup	Ports tt0/0, tt1/0, tt3/0,	Et0/1, Et Et1/3, Et Et3/3	0/2, Et(0/3 2/3			
VLAN Name default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-defaul	ro 1t		Stat act: act: act: act: act; act; act, act, act,	tus P ive E ive ive ive ive ve /unsup /unsup /unsup /unsup	Ports 1:t0/0, 1:t1/0, 1:t3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(2/0, Et	0/3 2/3			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-defau 1005 trbrf-default 1010 VOZ	r0 1t		Stat act: act: act: act: act: act; act; act; act, act, act,	tus P ive E ive ive ive ive /unsup /unsup /unsup /unsup /unsup /unsup	Ports t1/0, t1/0, t3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(2/0, Et	0/3 2/3			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-defau 1005 trbrf-default 1010 VOZ	ro 1t		Stat act: act: act: act: act; act, act, act, act,	tus P ive E ive ive ive /unsup /unsup /unsup /unsup /unsup ive	Corts Ct0/0, Ct1/0, Ct3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(2/0, Et	0/3 2/3			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-default 1005 trbrf-default 1010 VOZ 1111 VIDEONET 3456 ADMINISTRACIO			Stat act: act: act: act: act; act; act, act, act; act; act;	tus P ive E ive ive ive ive /unsup /unsup /unsup /unsup ive ive	Ports tt0/0, tt1/0, tt3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(0/3 2/3			
VLAN Name 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-default 1005 trbrf-default 1010 VOZ 1111 VIDEONET 3456 ADMINISTRACIO	10 1t		Stat act: act: act: act; act; act; act; act; act; act; act;	tus P ive E ive ive ive ive ve /unsup /unsup /unsup /unsup ive ive	Ports tt0/0, tt1/0, tt3/0,	Et0/1, Et Et1/3, Et Et3/3	:0/2, Et(2/0, Et)	0/3 2/3			
VLAN Name 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-default 1005 trbrf-default 1010 VOZ 1111 VIDEONET 3456 ADMINISTRACION VLAN Type SAID	10 Lt N MTU	Parent	Stat act: act: act: act: act; act; act; act; act; act; act; act;	tus P ive E ive ive ive ive /unsup /unsup /unsup /unsup ive ive ive ive ive	Ports tt0/0, tt1/0, tt3/0, tt3/0,	Et0/1, Et Et1/3, Et Et3/3 BrdgMode	:0/2, Et(2/0, Et?	0/3 2/3 Trans2			
VLAN Name 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-default 1005 trbrf-default 1010 VOZ 1111 VIDEONET 3456 ADMINISTRACIO VLAN Type SAID	ro 1t N <u>MTU</u>	Parent	Stat act: act: act: act: act; act; act; act; act; act; act; act;	tus P ive E ive ive ive ive ve /unsup /unsup /unsup /unsup ive ive ive ive	Corts Ct0/0, Ct1/0, Ct3/0, Ct3/0,	Et0/1, Et Et1/3, Et Et3/3 BrdgMode	0/2, Et(2/0, Et)	D/3 2/3 Trans2			
VLAN Name default 1 default 12 EJECUTIVOS 123 MANTENIMIENTO 234 HUESPEDES 434 ESTACIONAMIEN 800 NATIVA 1002 fddi-default 1003 trcrf-default 1004 fddinet-defau 1005 trbrf-default 1010 VOZ 1111 VIDEONET 3456 ADMINISTRACIO VLAN Type SAID 1 enet 100001	ro 1t N <u>MTU</u> 1500	Parent	Stat act: act: act: act: act; act, act, act; act; act: act: act: act: act: act: act: act:	tus P ive E ive ive ive ive /unsup /unsup /unsup /unsup /unsup ive ive ive ive	Corts Ct0/0, Ct1/0, Ct3/0,	Et0/1, Et Et1/3, Et Et3/3 BrdgMode	0/2, Et(2/0, Et;	Trans2 0			

2.9. Suspender VLAN 434 en DLS2.

DLS2

DLS2# conf ter DLS2(config)# vlan 434 DLS2(config-vlan)# state suspend DLS2(config-vlan)# exit Figura 66. Evidencia comando state suspend

DLS2 Enter DLS2 DLS2 DLS2 DLS2 *Dec DLS2	<pre># conf ter r configuration commands, one per (config) # vlan 434 (config-vlan) # state suspend (config-vlan) # exit (config) #exit # 6 23:47:35.072: %SYS-5-CONFIG_I # show vlan</pre>	line. End	d with (ed from	CNTL/Z.	≡ by coi	nsole
VLAN	Name	Status	Ports			
1	default	active	Et0/0, Et1/0, Et3/0,	Et0/1, Et1/3, Et3/3	Et0/2, Et2/0,	Et0/3 Et2/3
12	EJECUTIVOS	active				
123	MANTENIMIENTO	active				
234	HUESPEDES	active				
434	ESTACIONAMIENTO	suspended				
800	NATIVA	active				
1002	fddi-default	act/unsup				
1003	trcrf-default	act/unsup				
1004	fddinet-default	act/unsup				
1005	trbrf-default	act/unsup				
1010	VOZ	active				
1111	VIDEONET	active				
3456	ADMINISTRACION	active				

2.10.En DLS2, crear VLAN 567 con el nombre de CONTABILIDAD. La VLAN

de CONTABILIDAD no podrá estar disponible en cualquier otro Switch de la red.

DLS2

DLS2#conf ter DLS2(config)# vlan 567 DLS2(config-vlan)# name CONTABILIDAD DLS2(config-vlan)# exit DLS2(config)# interface port-channel 2 DLS2(config-if)#switchport trunk allowed vlan except 567 DLS2(config-if)#interface port-channel 3 DLS2(config-if)#switchport trunk allowed vlan except 567 DLS2(config-if)#switchport trunk allowed vlan except 567 DLS2(config-if)# exit

Figura 67. Configuración vlan 567 en DLS2

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

2.11. Configurar DLS1 como Spanning tree root para las VLAN 1, 12, 434, 800, 1010, 1111 y 3456 y como raíz secundaria para las VLAN 123 y 234.

DLS1

DLS1(config)# spanning-tree vlan 1,12,434,800,1010,1111,3456 root primary DLS1(config)# spanning-tree vlan 123,234 root secondary DLS1(config)# exit

Figura 68. Configuración spanning-tree en DLS1

```
DLS1(config) # spanning-tree vlan 1,12,434,800,1010,1111,3456 root primary
DLS1(config) # spanning-tree vlan 123,234 root secondary
DLS1(config) # exit
DLS1#
```

2.12. Configurar DLS2 como Spanning tree root para las VLAN 123 y 234 y como una raíz secundaria para las VLAN 12, 434, 800, 1010, 1111.

DLS2

DLS2(config)# spanning-tree vlan 123,234 root primary DLS2(config)# spanning-tree vlan 1,12,434,800,1010,1111,3456 root secondary DLS1(config)# exit

Figura 69. Configuración spanning-tree en DLS2

DLS2# conf ter Enter configuration commands, one per line. End with CNTL/Z. DLS2(config)# spanning-tree vlan 123,234 root primary DLS2(config)# spanning-tree vlan 1,12,434,800,1010,1111,3456 root secondary DLS2(config)#exit

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

DLS1

DLS1# conf ter DLS1(config)# interface range e0/1-2 DLS1(config-if-range)# switchport trunk native vlan 800 DLS1(config-if-range)# switchport trunk encap dot1q DLS1(config-if-range)# switchport mode trunk DLS1(config-if-range)#exit Figura 70. Configuración puertos troncales en DLS1



DLS2

DLS2# conf ter DLS2(config)# interface range e0/1-2 DLS1(config-if-range)# switchport trunk native vlan 800 DLS1(config-if-range)# switchport trunk encap dot1q DLS1(config-if-range)# switchport mode trunk DLS1(config-if-range)#exit

Figura 71. Configuración puertos troncales en DLS2



ALS1

ALS1# conf ter ALS1(config)# int ran e0/1-2 ALS1(config-if-range)# switchport trunk native vlan 800 ALS1(config-if-range)# switchport trunk encap dot1q ALS1(config-if-range)# switchport mode trunk ALS1(config-if-range)# exit



```
ALS1# conf ter

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

ALS1(config)# int ran e0/1-2

ALS1(config-if-range)# switchport trunk native vlan 800

ALS1(config-if-range)# switchport trunk encap dotlq

^

% Invalid input detected at '^' marker.

ALS1(config-if-range)# switchport trunk encap dotlq

^

% Invalid input detected at '^' marker.

ALS1(config-if-range)#

ALS1(config-if-range)#

ALS1(config-if-range)#

ALS1(config-if-range)#

ALS1(config-if-range)# switchport trunk encap dotlq

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

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

ALS1(config)#

*Dec 7 01:41:39.832: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to

*Dec 7 01:41:42.835: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to

ALS1(config)#
```

ALS2

ALS2# conf ter ALS2(config)# interface range e0/1-2 ALS2(config-if-range)# switchport trunk native vlan 800 ALS2(config-if-range)# switchport trunk encap dot1q ALS2(config-if-range)# switchport mode trunk ALS2(config-if-range)# switchport mode trunk

Figura 73. Configuración puertos troncales en ALS2

```
ALS2# conf ter

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

ALS2(config)# interf range e0/1-2

ALS2(config-if-range)# switchport trunk native vlan 800

ALS2(config-if-range)# switchport trunk encap dotlq

ALS2(config-if-range)# switchport mode trunk

ALS2(config-if-range)# switchport mode trunk

ALS2(config-if-range)#

*Dec 7 01:43:01.736: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down

*Dec 7 01:43:01.739: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down

ALS2(config-if-range)#

*Dec 7 01:43:04.748: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up

*Dec 7 01:43:04.748: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to up

*Dec 7 01:43:04.751: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up

*Dec 7 01:43:04.751: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to up

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

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

	naces como p		, asignados a las v	
Interfaz	DLS 1	DLS2	ALS1	ALS2
Interfaz Fa0/6	345 6	12 , 1010	123, 1010	234
Interfaz Fa0/15	111 1	1111	1111	1111
Interfaces F0 /16-18		567		

Tabla 2. Interfaces como puertos de acceso, asignados a las VLAN

Usamos el siguiente comando en cada una de las interfaces que conectan cada uno de los hosts y asignando la respectiva vlan según la tabla.

Se debe tener en cuenta que si un puerto está en acceso solo se puede asignar una sola vlan, si queremos configurar más vlan como acceso debemos tener más puertos disponibles, o configurar el puerto como troncal.

DLS1

DLS1# conf ter DLS1(config)# interface e0/2 DLS1(config-if)# switchport access vlan 3456 DLS1(config-if)# switchport mode acces DLS1(config-if)# switchport nonegotiate DLS1(config-if)# spanning-tree portfast DLS1(config-if)#no shutdown

Figura 74. Asignación de interface como puertos de acceso

```
DLS1(config) #interface e0/2
DLS1(config-if) # switchport access vlan 3456
% Access VLAN does not exist. Creating vlan 3456
DLS1(config-if) # switchport access vlan 345
% Access VLAN does not exist. Creating vlan 345
DLS1(config-if) # switchport mode acces
DLS1(config-if) # switchport nonegotiate
DLS1(config-if) # spanning-tree portfast
DLS1(config-if) # no shutdown
DLS1(config-if) #
```

DLS2

DLS2# conf ter DLS2(config)# interface e0/2 DLS2(config-if)# switchport mode acces DLS2(config-if)# switchport access vlan 12 DLS2(config-if)# switchport nonegotiate DLS2(config-if)# spanning-tree portfast DLS2(config-if)# no shutdown DLS2(config)# interface e0/2 DLS2(config-if)# switchport access vlan 1010 DLS2(config-if)# switchport nonegotiate DLS2(config-if)# spanning-tree portfast DLS2(config-if)# no shutdown



DLS2(config) # interface e0/2 DLS2(config-if) # switchport mode access DLS2(config-if) # switchport access vlan 12 DLS2(config-if) # switchport nonegotiate DLS2(config-if) # spanning-tree portfast %Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION
<pre>%Portfast has been configured on Ethernet0/2 but will only have effect when the interface is in a non-trunking mode. DLS2(config-if)# no shutdown DLS2(config-if)#</pre>
LS2(config) # interface e0/2 LS2(config) # switchport access vlan 1010 Access VLAN does not exist. Creating vlan 1010 LS2(config-if) # switchport nonegotiate command rejected: Conflict between 'nonegotiate' and 'dynamic' status on this interface: Et0/2 LS2(config-if) # spanning-tree portfast Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION
Portfast has been configured on Ethernet0/2 but will only have effect when the interface is in a non-trunking mode. LS2(config-if)#_no shutdown

ALS1

ALS1# conf ter ALS1(config)# interface e0/2 ALS1(config-if)# switchport access vlan 123 ALS1(config-if)# switchport mode acces ALS1(config-if)# switchport nonegotiate ALS1(config-if)# spanning-tree portfast ALS1(config-if)# no shutdown ALS1(config)# interface e0/2 ALS1(config-if)# switchport mode acces ALS1(config-if)# switchport access vlan 1010 ALS1(config-if)# switchport nonegotiate ALS1(config-if)# spanning-tree portfast ALS1(config-if)# no shutdown

```
Figura 76. Asignación de interface como puertos de acceso
```

```
ALS1(config)# interface e0/2
ALS1(config-if)# e acces
% Invalid input detected at '^' marker.
ALS1(config-if)# switchport access vlan 123
 ALS1(config-if) # switchport mode acces
 ALS1(config-if)# switchport nonegotiate
 ALS1(config-if)# spanning-tree portfast
 Warning: portfast should only be enabled on ports connected to a single
 host. Connecting hubs, concentrators, switches, bridges, etc... to this
 interface when portfast is enabled, can cause temporary bridging loops.
 Use with CAUTION
 %Portfast has been configured on Ethernet0/2 but will only
 have effect when the interface is in a non-trunking mode.
 ALS1(config-if)# no shutdown
ALS1(config)# interface e0/2
ALSI(config) # interface e0/2
ALSI(config-if) # switchport mode access
ALSI(config-if) # switchport access vlan 1010
ALSI(config-if) # switchport nonegotiate
ALSI(config-if) # spanning-tree portfast
*Warning: portfast should only be enabled on ports connected to a single
 host. Connecting hubs, concentrators, switches, bridges, etc... to this
 interface when portfast is enabled, can cause temporary bridging loops.
 Use with CAUTION
%Portfast has been configured on Ethernet0/2 but will only
have effect when the interface is in a non-trunking mode.
```

ALS2

ALS2# conf ter ALS2(config)# interface e0/2 ALS2(config-if)# switchport access vlan 234 ALS2(config-if)# switchport mode acces ALS2(config-if)# switchport nonegotiate ALS2(config-if)# spanning-tree portfast ALS2(config-if)# no shutdown

Figura 77. Asignación de interface como puertos de acceso

ALS2(config) # interface e0/2
ALS2(config-if)# switchport access vlan 234
ALS2(config-if)# switchport mode acces
ALS2(config-if)# switchport nonegotiate
ALS2(config-if)# spanning-tree portfast
<pre>\$Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION</pre>
<pre>%Portfast has been configured on Ethernet0/2 but will only have effect when the interface is in a non-trunking mode.</pre>
ALS2(config-if) # no shutdown
ALS2 (config-if) #

2.15. Part 2: conectividad de red de prueba y las opciones configuradas.

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

DLS1# show vlan

DLS1#	\$ show	vlan	Ū							
VLAN	Name				Stat	us P	orts			
	default .				acti	ive E E E E	Et0/0, Et0/1, Et0/2, Et0/3 Et1/0, Et1/1, Et1/2, Et1/3 Et2/0, Et2/1, Et2/2, Et2/3 Et3/0, Et3/1, Et3/2, Et3/3			
12	EJECUI	TIVOS			acti	ive				
123	MANTEN	IIMIENTO			acti	lve				
234	HUESPE	DES			acti	lve				
345	VLANOS	345			acti	lve				
434	ESTACI	ONAMIENTO			sus	ended				
	NATIVA				acti	ive				
1002	fddi-d	lefault				unsup				
1003	trorf-	-default				unsup				
1004	fddine	et-default			act,	unsup				
1005	trbrf-	default			act,	'unsup				
VLAN	Туре	SAID	MTU	Parent	RingNo	BridgeN	lo Stp	BrdgMode	Transl	Trans2
	enet	100001	1500							
12	enet	100012	1500							
123	enet	100123	1500							
VLAN	Type	SAID	MTU	Parent	RingNo	BridgeN	lo Stp	BrdgMode	Transl	Trans2
234	enet	100234	1500							
345	enet	100345	1500							
434	enet	100434	1500							
	enet	100800	1500							
1002	fddi	101002	1500							
1003	trcrf	101003	4472	1005	3276					
1004	fdnet	101004	1500				ieee			
1005	trbrf	101005	4472			15	ibm			
VLAN	AREHor	s STEHops	Backup	CRF						
1003			off							

Figura 78. Verificación Vlan en DLS1

DLS1# show ip interface brief

•	gara i er termeder		Sher on Bler	
DLS1# show ip inte:	face brief			
Interface	IP-Address	OK? Method	Status	Protocol
Ethernet0/0	unassigned	YES unset	up	up
Ethernet0/1	unassigned	YES unset	up	up
Ethernet0/2	unassigned	YES unset	up	up
Ethernet0/3	unassigned	YES unset	up	up
Ethernet1/0	unassigned	YES unset	up	up
Ethernet1/1	unassigned	YES unset	up	up
Ethernet1/2	unassigned	YES unset	up	up
Ethernet1/3	unassigned	YES unset	up	up
Ethernet2/0	unassigned	YES unset	up	up
Ethernet2/1	unassigned	YES unset	up	up
Ethernet2/2	unassigned	YES unset	up	up
Ethernet2/3	unassigned	YES unset	up	up
Ethernet3/0	unassigned	YES unset	up	up
Ethernet3/1	unassigned	YES unset	up	up
Ethernet3/2	unassigned	YES unset	up	up
Ethernet3/3	unassigned	YES unset	up	up
Vlanl	unassigned	YES unset	administratively down	down

Figura 79. Verificacion interface brief en DLS1

DLS1# show vtp status



DIDI# SHOW VCP SCACUS	
VTP Version capable	: 1 to 3
VTP version running	: 2
VTP Domain Name	: UNAD
VTP Pruning Mode	: Disabled
VTP Traps Generation	: Disabled
Device ID	: aabb.cc80.0100
Configuration last modified by	0.0.0.0 at 12-7-19 02:15:02
Local updater ID is 0.0.0.0 (no	valid interface found)
Feature VLAN:	
VTP Operating Mode	: Server
Maximum VLANs supported locally	7 : 1005
Number of existing VLANs	: 11
Configuration Revision	
MD5 digest	: 0x59 0x23 0x09 0x3B 0xC8 0xEF 0xC0 0x99 0x8D 0x76 0xA8 0x0A 0xEC 0x2C 0x15 0xF2
DT.S1#	

DLS2# show vlan

DLS2#	DLS2# show vlan									
VLAN	Name				Sta	tus P	Ports			
ı	default a				act:	ive E E E E	Et0/0, Et0/1, Et0/3, Et1/0 Et1/1, Et1/2, Et1/3, Et2/0 Et2/1, Et2/2, Et2/3, Et3/0 Et3/1, Et3/2, Et3/3			
12 123 234 434 567 800 1002 1003 1004 1005 1010	12 EJECUTIVOS active 12.3 MANTENIMIENTO active 12.4 HUESPEDES active 13.4 ESTACIONAMIENTO suspended 13.6 CONTABILIDAD active 14.6 CONTABILIDAD active 15.6 CONTABILIDAD active 10.02 fddi-default act/unsup 10.03 troff-default act/unsup 10.04 fddinet-default act/unsup 10.05 trbff-default active 10.01 VLAN1010 active									
VLAN	туре	SAID	MTU	Parent	RingNo	BridgeN	lo Stp	BrdgMode	Transl	Trans2
1	enet	100001	1500							
12	enet	100012	1500						0	0
VLAN	Type	SAID	MTU	Parent	RingNo	BridgeN	lo Stp	BrdgMode	Transl	Trans2
123	enet	100123	1500							
234		100234	1500							
434	enet	100434	1500							
567	enet	100567	1500							
800	enet	100800	1500							
1002	fddi	101002	1500							
1003	trerf	101003	4472	1005	3276			srb		
1004	fdnet	101004	1500				ieee			
1005	trbrf	101005	4472			15	ibm			
1010	enet	101010	1500							
VLAN	AREHOR	os STEHops	Backup	CRF						
1003	7	7	off							

Figura 81. Verificación Vlan en DLS2

DLS2# show ip interface brief

	i iguiu 02. Volillouok		lonuoo		
DLS2# show ip	interface brief				
Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	unassigned	YES	unset	up	up
Ethernet0/1	unassigned	YES	unset	up	up
Ethernet0/2	unassigned	YES	unset	up	up
Ethernet0/3	unassigned	YES	unset	up	up
Ethernet1/0	unassigned	YES	unset	up	up
Ethernet1/1	unassigned	YES	unset	up	up
Ethernet1/2	unassigned	YES	unset	up	up
Ethernet1/3	unassigned	YES	unset	up	up
Ethernet2/0	unassigned	YES	unset	up	up
Ethernet2/1	unassigned	YES	unset	up	up
Ethernet2/2	unassigned	YES	unset	up	up
Ethernet2/3	unassigned	YES	unset	up	up
Ethernet3/0	unassigned	YES	unset	up	up
Ethernet3/1	unassigned	YES	unset	up	up
Ethernet3/2	unassigned	YES	unset	up	up
Ethernet3/3	unassigned	YES	unset	up	up
Vlanl	unassigned	YES	unset	administratively down	down
DLS2#					

Figura 82. Verificación interface brief en DLS2

DLS2# show vtp status

Figura 83. Verificación vtp status en DLS2

Viani	unassiyneu	TES uns	et aumin	isciacivei	y uowi	i uowii
DLS2# show vtp status						
VTP Version capable	: 1 to	o 3				
VTP version running	: 2					
VTP Domain Name						
VTP Pruning Mode	: Disa	abled				
VTP Traps Generation	: Disa	abled				
Device ID	: aabl	b.cc80.02(00			
Configuration last mod	dified by 0.0.0.0	0 at 0-0-0	00 00:00:	00		
Feature VLAN:						
VTP Operating Mode	: T:	ransparent	t			
Maximum VLANs supporte	ed locally : 10	005				
Number of existing VLA	ANs : 1	1				
Configuration Revision	n :0					
MD5 digest	: 0:	xC8 0x02 (0x9E 0xEl	0x24 0x37	0x53	0xF6
	0:	xE9 0xD5 (0x65 0xBD	0x83 0xF4	0xCF	0xCC
DLS2#						

ALS1# show vlan

ALS1#	show :	vlan										
VLAN	Name					Status Ports						
l	default					ive E E E E	Et0/0, Et0/1, Et0/3, Et1/0 Et1/1, Et1/2, Et1/3, Et2/0 Et2/1, Et2/2, Et2/3, Et3/0 Ft3/1 Ft3/2 Ft3/3					
12	EJECUI	rtvos			act	ive –						
123	MANTENIMIENTO				act	active						
234	HUESPE	DES			act	active						
434	ESTACI	IONAMTENTO			31131	suspended						
800	NATTVZ	4			act	active						
1002	fddi-d	- default			act.	act/unsup						
1003	trorf-default					/unsup						
1004	fddinet-default					act/unsup						
1005	trbrf-default			act.	act/unsup							
VLAN	Type	SAID	MTU	Parent	RingNo	BridgeN	lo Stp	BrdgMode	Transl	Trans2		
1		100001	1500									
12	enet	1000012	1500						0	0		
123	enet	100012	1500						0	ő		
234	enet	100234	1500						0	0		
201	CIICO	100201	1000									
VLAN	Type	SAID	MTU	Parent	RingNo	BridgeN	lo Stp	BrdgMode	Transl	Trans2		
434	enet	100434	1500						0	0		
800	enet	100800	1500						0	0		
1002	fddi	101002	1500									
1003	trcrf	101003	4472	1005	3276			srb		0		
1004	fdnet	101004	1500				ieee		0	0		
1005	trbrf	101005	4472			15	ibm					
VLAN	AREHOR	os STEHops	Backup	CRF								
1003	7	7	off									
Remote SPAN VLANS												

Figura 84. Verificación vlan en ALS1

ALS1# show ip interface brief

Figura 85. Verificación interface brief en ALS1

ALS1# show ip	interface brief				
Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	unassigned	YES	unset	up	up
Ethernet0/1	unassigned	YES	unset	up	up
Ethernet0/2	unassigned	YES	unset	up	up
Ethernet0/3	unassigned	YES	unset	up	up
Ethernet1/0	unassigned	YES	unset	up	up
Ethernet1/1	unassigned	YES	unset	up	up
Ethernet1/2	unassigned	YES	unset	up	up
Ethernet1/3	unassigned	YES	unset	up	up
Ethernet2/0	unassigned	YES	unset	up	up
Ethernet2/1	unassigned	YES	unset	up	up
Ethernet2/2	unassigned	YES	unset	up	up
Ethernet2/3	unassigned	YES	unset	up	up
Ethernet3/0	unassigned	YES	unset	up	up
Ethernet3/1	unassigned	YES	unset	up	up
Ethernet3/2	unassigned	YES	unset	up	up
Ethernet3/3	unassigned	YES	unset	up	up
Vlanl	unassigned	YES	unset	administratively down	down
ALS1#					

ALS1# show vtp status

Figura 86. Venilication vip status en ALS I	Figura 86.	Verificación	vtp status	en ALS1
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ALSI# show vtp status	
VTP Version capable :	1 to 3
VTP version running :	2
VTP Domain Name :	UNAD
VTP Pruning Mode :	Disabled
VTP Traps Generation :	Disabled
Device ID :	aabb.cc80.0300
Configuration last modified by 10	.12.12.1 at 12-6-19 23:29:37
Feature VLAN:	
VTP Operating Mode	: Client
Maximum VLANs supported locally	: 1005
Number of existing VLANs	: 10
Configuration Revision	: 7
MD5 digest	: 0xAF 0x12 0x3D 0x37 0xF2 0x95 0xD6 0xAB
	0xFC 0x72 0x0C 0x6D 0xFB 0xCD 0x1D 0xB4
ALS1#	

ALS2# show vlan

ALS2	ALS2# show vlan											
VLAN	Name				Stat	Status Ports						
l	default				act:	ive	Et0/0, Et0/1, Et0/2, Et0/3 Et1/0, Et1/1, Et1/2, Et1/3 Et2/0, Et2/1, Et2/2, Et2/3 Et3/0, Et3/1, Et3/2, Et3/3					
12	EJECUI	TIVOS			act:	ive						
123	MANTEN	IMIENTO			act:	active						
234	HUESPE	DES			act:	active						
434	ESTACI	ONAMIENTO			sus	pended						
800	NATIVA					active						
1002	fddi-d	lefault			act,	/unsup						
1003	trcrf-default					/unsup						
1004	fddinet-default				act,	act/unsup						
1005	trbrf-	-default			act,	/unsup						
VLAN	Type	SAID	MTU	Parent	RingNo	Bridge	No St	p	BrdgMode	e Transl	Trans2	
1	enet	100001	1500							o	0	
12	enet	100012	1500							0	0	
123	enet	100123	1500							0	0	
234	enet	100234	1500							0	0	
VLAN	Туре 	SAID	MTU	Parent	RingNo	Bridge	No St	p	BrdgMode	E Transl	Trans2	
434	enet	100434	1500							0	0	
800	enet	100800	1500							0	0	
1002	fddi	101002	1500							0	0	
1003	trcrf	101003	4472	1005	3276				srb	0	0	
1004	fdnet	101004	1500				ie	ee		0	0	
1005	trbrf	101005	4472			15	ib	m		0	0	
VLAN	AREHop	os STEHops	Backup	CRF								
1003			off									

Figura 87. Verificación vlan en ALS2

ALS2# show ip interface brief

Figura 88. Verificación interface brief en AL	S2
---	----

ALS2# show ip interfac	e brief				
Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0/0	unassigned	YES	unset	up	up
Ethernet0/1	unassigned	YES	unset	up	up
Ethernet0/2	unassigned	YES	unset	up	up
Ethernet0/3	unassigned	YES	unset	up	up
Ethernet1/0	unassigned	YES	unset	up	up
Ethernet1/1	unassigned	YES	unset	up	up
Ethernet1/2	unassigned	YES	unset	up	up
Ethernet1/3	unassigned	YES	unset	up	up
Ethernet2/0	unassigned	YES	unset	up	up
Ethernet2/1	unassigned	YES	unset	up	up
Ethernet2/2	unassigned	YES	unset	up	up
Ethernet2/3	unassigned	YES	unset	up	up
Ethernet3/0	unassigned	YES	unset	up	up
Ethernet3/1	unassigned	YES	unset	up	up
Ethernet3/2	unassigned	YES	unset	up	up
Ethernet3/3	unassigned	YES	unset	up	up
Vlanl	unassigned	YES	unset	administratively dow	n down
ALS2#					

ALS2# show vtp status

```
Figura 89. Verificación vtp status en ALS2
```

ALS2# show vtp status	
VTP Version capable	: 1 to 3
VTP version running	: 2
VTP Domain Name	: UNAD
VTP Pruning Mode	: Disabled
VTP Traps Generation	: Disabled
Device ID	: aabb.cc80.0400
Configuration last modified by 1	0.12.12.1 at 12-6-19 23:29:37
Feature VLAN:	
VTP Operating Mode	: Client
Maximum VLANs supported locally	: 1005
Number of existing VLANs	: 10
Configuration Revision	: 7
MD5 digest	: 0xAF 0x12 0x3D 0x37 0xF2 0x95 0xD6 0xAB
	0xFC 0x72 0x0C 0x6D 0xFB 0xCD 0x1D 0xB4
AT CO#	

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

DLS1# show etherchannel summary

```
Figura 90. Verificación Etherhannel DLS1
```

DLS1# show etherchannel summary Flags: D - down P - bundled in port-channel I - stand-alone s - suspended H - Hot-standby (LACP only) R - Layer3 S - Layer2 U - in use N - not in use, no aggregation f - failed to allocate aggregator							
M - not in use, minimum links not met m - not in use, port not aggregated due to minimum links not met u - unsuitable for bundling w - waiting to be aggregated d - default port A - formed by Auto LAG							
Number of channel-groups in use: 3 Number of aggregators: 3							
Group	Port-channel	Protocol	Ports				
1 4 12 DLS1#	Pol (SU) Po4 (SU) Pol2 (RU)	LACP PAgP LACP	Et3/1(P) Et2/1(P) Et1/1(P)	Et3/2(P) Et2/2(P) Et1/2(P)			

ALS1# show etherchannel summary

Figura 91. Verificación	Etherhannel ALS1
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2.15.3. Verificar la configuración de Spanning tree entre DLS1 o DLS2 para cada VLAN.

DLS1# show spanning-tree

|--|

DLS1# show s	panning-tree				
VLAN0001 Spanning t	ree enabled p		col rstp		
Root ID	Priority Address	2457 aabb	7 .cc00.0100		
	Hello Time	2 s	ec Max Ag	je 20 sec	Forward Delay 15 sec
Bridge ID	Priority Address	2457 aabb	7 (priori .cc00.0100	ty 24576	sys-id-ext 1)
	Hello Time Aging Time	2 s 300 :	ec Max Aq sec	re 20 sec	Forward Delay 15 sec
Interface	Role		Cost	Prio.Nbr	Type
Et0/0	Desg	FWD :	100	128.1	
Et0/1	Desg	FWD :	100	128.2	
Et0/2	Desg	FWD :	100	128.3	
Et0/3	Desg	FWD :	100	128.4	
Et1/0	Desg	FWD :	100	128.5	
Et1/1	Desg	FWD :	100	128.6	
Et1/2	Desg	FWD 3	100	128.7	
Et1/3	Desg	FWD :	100	128.8	
Interface	Role	Sts (Cost	Prio.Nbr	Туре
Et2/0	Desg	FWD :	100	128.9	Shr
Et2/1	Desg	FWD :	100	128.10	Shr
Et2/2	Desg	FWD :	100	128.11	Shr
Et2/3	Desg	FWD :	100	128.12	Shr
Et3/0	Desg	FWD :	100	128.13	Shr
Et3/1	Desg	FWD :	100	128.14	Shr
Et3/2	Desg	FWD :	100	128.15	Shr
Et3/3	Desg	FWD :	100	128.16	Shr

DLS2# show spanning-tree

Figura 93. Verificación spanning-tree DSL2								
DLS2# show sp	panning-tree							
VLAN0001								
Spanning t	ree enabled p	protocol	rstp					
Root ID	Priority	24577						
	Address	aabb.cc	00.0100)				
	Cost	100						
	Port	6 (Ethe	rnet1/1					
	Hello Time	2 sec	Max Aq	ge 20 sec	Forward	Delay 1	5 sec	
Bridge ID	Priority	28673	(priori	ity 28672	sys-id-ex	(t 1)		
	Address	aabb.cc	aabb.cc00.0200					
	Hello Time	2 sec	Max Aq	ge 20 sec	Forward	Delay 1	5 sec	
	Aging Time	300 sec						
Interface	Role	Sts Cos	t	Prio.Nbr	Туре			
Et0/0	Desg	FWD 100		128.1	Shr			
Et0/1	Desg	FWD 100		128.2	Shr			
Et0/3	Desg	FWD 100		128.4	Shr			
Et1/0	Desg	FWD 100		128.5	Shr			
Et1/1	Root	FWD 100		128.6	Shr			
Et1/2	Altn	BLK 100		128.7	Shr			
Et1/3	Desg	FWD 100		128.8	Shr			
Et2/0	Desg	FWD 100		128.9	Shr			
Et2/1	Desg	FWD 100		128.10	Shr			
Et2/2	Desg	FWD 100		128.11	Shr			
Et2/3	Desg	FWD 100		128.12	Shr			
Et3/0	Desg	FWD 100		128.13	Shr			
Et3/1	Desg	FWD 100		128.14	Shr			
Et3/2	Desg	FWD 100		128.15	Shr			
Et3/3	Desg	FWD 100		128.16	Shr			
VLAN1010								
Spanning t	ree enabled p	protocol	rstp					
Root ID	Priority	29682						
1000 12	Address	25002						
	Address Rhie heider							
	Inis bridge	is the	root					
	Hello Time	2 sec	Max Aq	ge 20 sec	Forward	Delay 1	5 sec	
Bridge ID	Priority	29682	(priori	ity 28672	sys-id-ex	t 1010)		
	Address	aabb.cc	00.0200)				
	Hello Time	2 sec	Max Ad	ae 20 sec	Forward	Delav 1	5 sec	
	Aging Time	300 sec	;	-				
Interface	Role	Sts Cos	t	Prio.Nbr	Туре			
Et0/2	Desg	FWD 100		128.3	Shr Edge			
DI SOH								
DLJZ#								

Figura 93.	Verificación	spanning-tree DSL2	

ALS1# show spanning-tree

ALS1# show sp	panning-tree									
VLAN0001										
Spanning tree enabled protocol rstp										
Root ID	Priority	24577								
	Address	aabb.cc00.0100								
	Cost	100								
	Port	14 (Ethernet3/1)								
	Hello Time	2 sec Max Age 20 sec Forward Delay 15 sec								
Bridge ID	Priority Address	32769 (priority 32768 sys-id-ext 1) aabb.cc00.0300								
	Hello Time Aging Time	2 s 300	ec Max Ag sec	je 20 sec	Forward Delay 15 sec					
Interface	Role	Sts	Cost	Prio.Nbr	Туре					
Et0/0	Desg	FWD	100	128.1	Shr					
Et0/1	Desg	FWD	100	128.2	Shr					
Et0/3	Desg	FWD	100	128.4	Shr					
Et1/0	Desg	FWD	100	128.5	Shr					
Et1/1	Desg	FWD	100	128.6	Shr					
Et1/2	Desg	FWD	100	128.7	Shr					
Et1/3	Desg	FWD	100	128.8	Shr					
Interface	Role	Sts	Cost	Prio.Nbr	Туре					
Et2/0	Desg	FWD	100	128.9	Shr					
Et2/1	Altn	BLK	100	128.10	Shr					
Et2/2	Altn	BLK	100	128.11	Shr					
Et2/3	Desg	FWD	100	128.12	Shr					
Et3/0	Desg	FWD	100	128.13	Shr					
Et3/1	Root	FWD	100	128.14	Shr					
Et3/2	Altn	BLK	100	128.15	Shr					
Et3/3	Desg	FWD	100	128.16	Shr					

Figura 94. Verificación spanning-tree ASL1

ALS2# show spanning-tree
ALS2# show spanning-tree								
VLAN0001								
Spanning t	ree enabled p	proto	ocol rstp					
Root ID	Priority	2451	77 -					
	Address	aabb.cc00.0100						
	Cost	100						
	Port	10	(Ethernet	2/1)				
	Hello Time	2 :	sec Max J	Age 20 sec	Forward	Delay	15	sec
Bridge ID	Priority Address	327(aabl	59 (prio 5.cc00.04	rity 32768 00	sys-id-ex	kt 1)		
	Hello Time	2 :	sec Max	Age 20 sec	Forward	Delay	15	sec
	Aging Time	300	sec					
Interface	Role	Sts	Cost	Prio.Nbr	Туре			
Et0/0	Desg	FWD	100	128.1	Shr			
Et0/1	Desg	FWD	100	128.2	Shr			
Et0/2	Desg	FWD	100	128.3	Shr			
Et0/3	Desg	FWD	100	128.4	Shr			
Et1/0	Desg	FWD	100	128.5	Shr			
Et1/1	Desg	FWD	100	128.6	Shr			
Et1/2	Desg	FWD	100	128.7	Shr			
Et1/3	Desg	FWD	100	128.8	Shr			
Et2/0	Desg	FWD	100	128.9	Shr			
Et2/1	Root	FWD	100	128.10	Shr			
Et2/2	Altn	BLK	100	128.11	Shr			
Et2/3	Desg	FWD	100	128.12	Shr			
Et3/0	Desg	FWD	100	128.13	Shr			
Et3/1	Altn	BLK	100	128.14	Shr			
Et3/2	Altn	BLK	100	128.15	Shr			
Et3/3	Desg	FWD	100	128.16	Shr			

Figura 95. Verificación spanning-tree ALS2

CONCLUSIONES

Se utilizaron conocimientos de configuración de dispositivos activos router y switch tanto básicos como de mayor complejidad aprendidos durante los estudios del CCNA y CCNP de CISCO, para la solución de los problemas planteados.

Para evitar que un Router ajeno, sea introducido de manera clandestina a la red, es necesario la implementación de una autenticación de los mensajes de actualización de las rutas, para el protocolo usado en nuestros enrutadores.

Las configuraciones básicas en los dispositivos de comunicación cisco permiten al estudiante bases para la configuración de redes locales y llevarlas a topologías más grandes.

Se pudo lograr la comprobación de la conectividad de los equipos y encontrar los datos faltantes. También se logró la implementación de las claves de seguridad y la encriptación de las mismas.

Se realizó la configuración y enrutamiento de datos a través de routers, por medio de protocolos EIGRP, OSPF y áreas de forma que se segmento la red de forma exitosa

Se establecio la funcionalidad de los comandos detallada del paso a paso de cada una de las etapas realizadas durante su desarrollo, el registro de los procesos de verificación de conectividad mediante el uso de comandos ping, traceroute, show ip route, entre otros.

Puse a prueba las habilidades adquiridas en networking, frente a la solución de problemas de configuración de equipo activos de red, logrando la implementación de redes sugeridas y la solución de problemas encontrados durante su desarrollo

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