DIPLOMADO DE PROFUNDIZACION CISCO
PRUEBA DE HABILIDADES PRACTICAS CCNP

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA
ESCUELA DE INGERNIERIAS BASICAS, TECNOLOGIA E INGENIERIA ECBTI
INGENIERÍA ELECTRONICA
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Diplomado de opción de grado presentado para optar el titulo
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NOTA DE ACEPTACIÓN:

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Presidente del Jurado

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Jurado

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Jurado

Facatativá, 13 de abril de 2020

AGRADECIMIENTOS

En primera instancia le doy gracias a Dios por permitirme tener esta oportunidad de crecimiento profesional, de experiencias intelectuales y por qué siempre me dio las mejores soluciones para conseguir mis metas y mis sueños, también agradecer a mis padres y hermanos que me apoyaron siempre, en cumplir mis objetivos. También agradezco a la UNAD a sus tutores por su gran labor y apoyar de esta metodología a todos aquellos que no tienen la posibilidad de realizar una carrera profesional en forma presencial.

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RESUMEN

A lo largo de la historia la tecnología ha dado grandes avances y aportes significativos, es preciso poder utilizarla y dar buen uso a esos recursos, un gran avance ha sido las redes informáticas, La UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA ha implementado el diplomado de profundización CISCO CCNP para brindar más soluciones a todos los que tienen en mente adquirir alguna habilidad relacionada al tema de redes de computadores. En esta oportunidad se ha dado como opción de grado un diplomado en Cisco, (Diplomado cisco CCNP).

El objetivo de este trabajo es demostrar las habilidades adquiridas a lo largo del diplomado de profundización CCNP, Que brindó la UNAD en conjunto con la plataforma netacademy de CISCO. En el desarrollo de este trabajo se le dará solución a dos escenarios propuestos donde se evidencian los resultados de los mismos.

Palabras clave: Cisco, Packet tracer, router, switch, topología

ABSTRACT

Throughout history, technology has made great advances and significant contributions, it is necessary to be able to use it and make good use of these resources. A great advance has been computer networks. UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA has implemented the CISCO CCNP deepening diploma to provide more solutions. to all who have in mind to acquire some skill related to the subject of computer networks. This time, a specialization course in Cisco has been provided as a degree option (Cisco CCNP).

The objective of this work is to demonstrate the skills acquired throughout the CCNP specialization course, provided by UNAD gathered with the CISCO netacademy platform. The develop of this document it´s to give a solution for two cases proposed it will show how the cases are solved and their results will be shown.

Keywords: Cisco, Packet tracer, router, switch, topology.

INTRODUCCIÓN

A continuación, se realizarán las actividades correspondientes a la prueba de habilidades practica del diplomado CCNP, en el cual se plantean dos escenarios, los cuales presentan diferentes topologías y ambientes.

El primer escenario corresponde a dar solución a una empresa de confecciones que posee tres sucursales distribuidas en diferentes ciudades, se plantea configurar e interconectar los dispositivos implementando los protocolos EIGRP y OSPF.

Igualmente, en el segundo escenario se propone configurar e interconectar los dispositivos implementando VLAN y protocolos como STP a una empresa de comunicaciones, la cual presenta una estructura Core acorde a la topología de red.

ESCENARIO 1.

Descripción del escenario propuestos para la prueba de habilidades.

1 Escenario 1 propuesto para la prueba de habilidades.

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.

1.1 Topología de red.

Topología de red

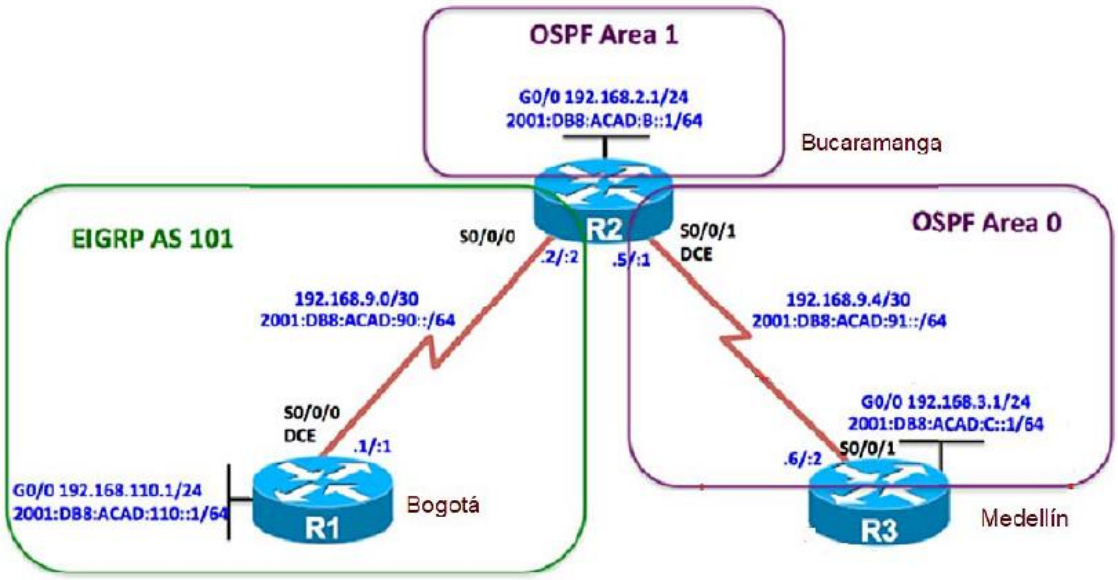

Ilustración 1: Topología de red escenario 1.

Parte 1: Configuración del escenario propuesto.

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

B. 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

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#int S0/0/0
R1(config-if)#ip address 192.168.9.1 255.255.255.252
R1(config-if)#ipv6 address 2001:DB8:ACAD:90::1/64
R1(config-if)#bandwidth 128
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#exit
R1(config)#int fa 0/0
R1(config-if)#ip address 192.168.110.1 255.255.255.0
R1(config-if)#ipv6 address 2001:DB8:ACAD:10::1/64
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
exit
R1(config)#
R1#
%SYS-5-CONFIG_I: Configured from console by console R2
```

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#int s0/0/0
R2(config-if)#ip address 192.168.9.2 255.255.255.252
R2(config-if)#ipv6 address 2001:DB8:ACAD:90::2/64
R2(config-if)#bandwidth 128
R2(config-if)#no shutdown

R2(config-if)#
```

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

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

R2(config-if)#exit
R2(config)#int fa 0/0
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)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

R2(config-if)#exit
R2(config)#int s0/0/1
R2(config-if)#ip address 192.168.9.5 255.255.255.252
R2(config-if)#ipv6 address 2001:DB8:ACAD:91::1/64
R2(config-if)#bandwidth 128
R2(config-if)#clock rate 128000
R2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R3

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#int s0/0/1
R3(config-if)#ip address 192.168.9.6 255.255.255.252
R3(config-if)#ipv6 address 2001:DB8:ACAD:91::2/64
R3(config-if)#bandwidth 128
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

```
R3(config-if)#exit
R3(config)#int fa o/0
^
% Invalid input detected at '^' marker.
R3(config)#int fa 0/0
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)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
exit
R3(config)#
```

C. En R2 y R3 configurar las familias de direcciones OSPFv3 para IPv4 e IPv6. Utilice el identificador de enrutamiento 2.2.2.2 en R2 y 3.3.3.3 en R3 para ambas familias de direcciones.

Ospf en 2 y 3

```
R2>
R2>enable
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ipv6 unicast-routing
R2(config)#router ospfv3 1
^
% Invalid input detected at '^' marker.
R2(config)#router ospf 1
R2(config-router)#router-id 2.2.2.2
R2(config-router)#address-family ipv6 unicast
^
% Invalid input detected at '^' marker.
R2(config-router)#
R2(config-router)#
R2(config-router)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R3>enable
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ipv6 unicast-routing
R3(config)#router ospf 1
```

```
R3(config-router)#router-id 3.3.3.3
R3(config-router)#
R3(config-router)#
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

D. En R2, configurar la interfaz F0/0 en el área 1 de OSPF y la conexión serial entre R2 y R3 en OSPF área 0.

```
R2(config)#router ospf 1
R2(config-router)#network 192.168.2.0 0.0.0.255 area 1
R2(config-router)#network 192.168.9.4 0.0.0.3 area 0
R2(config-router)#ipv6 unicast-routing
R2(config)#ipv6 router ospf 1
R2(config-rtr)#router-id 2.2.2.2
R2(config-rtr)#exit
R2(config)#int fa 0/0
R2(config-if)#ipv6 ospf 1 area 1
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#int s0/0/1
R2(config-if)#ipv6 ospf 1 area 0
R2(config-if)#no shutdown
R2(config-if)#
```

E. En R3, configurar la interfaz F0/0 y la conexión serial entre R2 y R3 en OSPF área 0.

```
R3>
R3>enable
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#network 192.168.3.0 0.0.0.255 area 0
R3(config-router)#network 192.168.9.4 0.0.0.3 area 0
R3(config-router)#ipv6
01:06:32: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from
LOADING to FULL, Loading
R3(config-router)#ipv6 unicast-routing
R3(config)#ipv6 router ospf 1
R3(config-rtr)#router-id 3.3.3.3
```

```
R3(config-rtr)#exit
R3(config)#int fa 0/0
R3(config-if)#ipv6 ospf 1 area 1
R3(config-if)#no shutdown
R3(config-if)#exit
R3(config)#int s0/0/1
R3(config-if)#ipv6 ospf 1 area 0
R3(config-if)#no shutdo
01:09:05: %OSPFv3-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from
LOADING to FULL, Load
R3(config-if)#no shutdown
R3(config-if)#
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

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

```
R2#enable
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int fa 0/0
R2(config-if)#router ospf 1
R2(config-router)#area 1 stub
R2(config-router)#exit
R2(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console
```

G. 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(config)#router ospf 1
R3(config-router)#log-adjacency-changes
R3(config-router)#
R3(config-router)#exit
R3(config)#ipv6 router ospf 1
R3(config-rtr)#log adjacency-changes
% Ambiguous command: "log adjacency-changes"
R3(config)#log-adjacency-changes
```

```
^
% Invalid input detected at '^' marker.
R3(config)#ipv6 router ospf 1
R3(config-rtr)#log-adjacency-changes
R3(config-rtr)#exit
R3(config)#
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

H. 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.

```
R1#
R1#enable
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ipv6 unicast-routing
R1(config)#router eigrp 101
R1(config-router)#network 192.168.110.0
R1(config-router)#network 192.168.9.0
R1(config-router)#no auto-summary
R1(config-router)#exit
R1(config)#int fa 0/0
R1(config-if)#ipv6 eigrp 101
R1(config-if)#exit
R1(config)#int s0/0/0
R1(config-if)#ipv6 eigrp 101
R1(config-if)#exit
R1(config)#
```

```
R2>enable
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router eigrp 101
R2(config-router)#network 192.168.2.0
R2(config-router)#network 192.168.9.0
R2(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 101: Neighbor 192.168.9.1 (Serial0/0/0)
is up: new adjacency
```

```
R2(config-router)#no auto-summary
R2(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 101: Neighbor 192.168.9.1 (Serial0/0/0)
resync: summary configured

R2(config-router)#
```

I. Configurar las interfaces pasivas para EIGRP según sea apropiado.

```
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router eigrp 101
R1(config-router)#passive-interface s0/0/0
R1(config-router)#passive-interface fa0/0
R1(config-router)#
R1(config-router)#exit
R1(config)#end
```

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

```
R2#
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router eigrp 101
R2(config-router)#redistribute ospf 1 metric?
metric
R2(config-router)#router eigrp 101?
% Unrecognized command
R2(config-router)#redistribute ospf 1 metric ?
<1-4294967295> Bandwidth metric in Kbits per second
R2(config-router)#redistribute ospf 1 metric 155 ?
<0-4294967295> EIGRP delay metric, in 10 microsecond units
R2(config-router)#redistribute ospf 1 metric 155 300?
<0-4294967295>
R2(config-router)#redistribute ospf 1 metric 155 300?
<0-4294967295>
R2(config-router)#redistribute ospf 1 metric 155 300 110?
```

```
<0-255>
R2(config-router)#redistribute ospf 1 metric 155 300 110 1?
<1-255>
R2(config-router)#redistribute ospf 1 metric 155 300 110 1 250?
<1-65535>
R2(config-router)#redistribute ospf 1 metric 155 300 110 1 250
R2(config-router)#
```

K. 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 t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#access-list 1 denny 192.168.3.0 0.0.0.255
^
% Invalid input detected at '^' marker.
R2(config)#access-list 1 deny 192.168.3.0 0.0.0.255
R2(config)#access-list 1 permit any
R2(config)#
R2(config)#

R2#show access-list
Standard IP access list 1
10 deny 192.168.3.0 0.0.0.255
20 permit any
R2#
R2#
```

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

A. 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
```

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

Gateway of last resort is not set

192.168.9.0/30 is subnetted, 1 subnets
C 192.168.9.0 is directly connected, Serial0/0/0
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

192.168.9.0/30 is subnetted, 1 subnets
C 192.168.9.0 is directly connected, Serial0/0/0
R1#

R1

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

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 1 subnets
C       192.168.9.0 is directly connected, Serial0/0/0
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 1 subnets
C       192.168.9.0 is directly connected, Serial0/0/0
R1#
```

Ilustración 2: Tabla enrutamiento R1

R2

```
R2#
R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 2 subnets
C       192.168.9.0 is directly connected, Serial0/0/0
C       192.168.9.4 is directly connected, Serial0/0/1
R2#
R2#show ipv6 route
IPv6 Routing Table - 5 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
C   2001:DB8:ACAD:90::/64 [0/0]
     via ::, Serial0/0/0
L   2001:DB8:ACAD:90::2/128 [0/0]
     via ::, Serial0/0/0
C   2001:DB8:ACAD:91::/64 [0/0]
     via ::, Serial0/0/1
L   2001:DB8:ACAD:91::1/128 [0/0]
     via ::, Serial0/0/1
L   FF00::/8 [0/0]
     via ::, Null0
R2#
```

Ilustración 3: Tabla enrutamiento R2

R3

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

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 1 subnets
C       192.168.9.4 is directly connected, Serial0/0/1
R3#
```

Ilustración 4: Tabla enrutamiento R3.

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

Ping 1 a 2

```
R1>enable
R1#192.168.9.2
Trying 192.168.9.2 ...Open

[Connection to 192.168.9.2 closed by foreign host]
R1#ping 192.168.9.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/17 ms

R1#
```

Ilustración 5: Verificación comunicación Ping 1 a 2.

Ping 2 a 1

```
R2>enable
R2#ping 192.168.9.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/14 ms

R2#
```

Ilustración 6: Verificación comunicación Ping 2 a 1.

Ping 2 a 3

```
R2>enable
R2#ping 192.168.9.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/14 ms

R2#ping 192.168.9.6

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.6, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/25 ms

R2#
```

Ilustración 7: Verificación comunicación Ping 2 a 3.

Ping 3 a 2

```
R3>
R3>
R3>enable
R3#ping 192.168.9.5

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.5, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/13 ms

R3#
```

Ilustración 8: Verificación comunicación Ping 3 a 2.

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

R1

```
R1>enable
R1#192.168.9.2
Trying 192.168.9.2 ...Open

[Connection to 192.168.9.2 closed by foreign host]
R1#ping 192.168.9.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/4/17 ms

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

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 1 subnets
C       192.168.9.0 is directly connected, Serial0/0/0
R1#
```

Ilustración 9: Rutas filtradas R1

.

R2

```
R2>enable
R2#ping 192.168.9.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/14 ms

R2#ping 192.168.9.6

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.6, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/25 ms

R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 2 subnets
C       192.168.9.0 is directly connected, Serial0/0/0
C       192.168.9.4 is directly connected, Serial0/0/1
R2#
```

Ilustración 10: Rutas Filtradas R2.

R3

```
R3>
R3>
R3>enable
R3#ping 192.168.9.5

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.9.5, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/13 ms

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

Gateway of last resort is not set

     192.168.9.0/30 is subnetted, 1 subnets
C       192.168.9.4 is directly connected, Serial0/0/1
R3#
```

Ilustración 11: Rutas Filtradas R3.

ESCENARIO 2.

Descripción del escenario propuestos para la prueba de habilidades.

2. Escenario 2 propuesto para la prueba de habilidades.

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.

2.1. Topología de red.

Topología de red

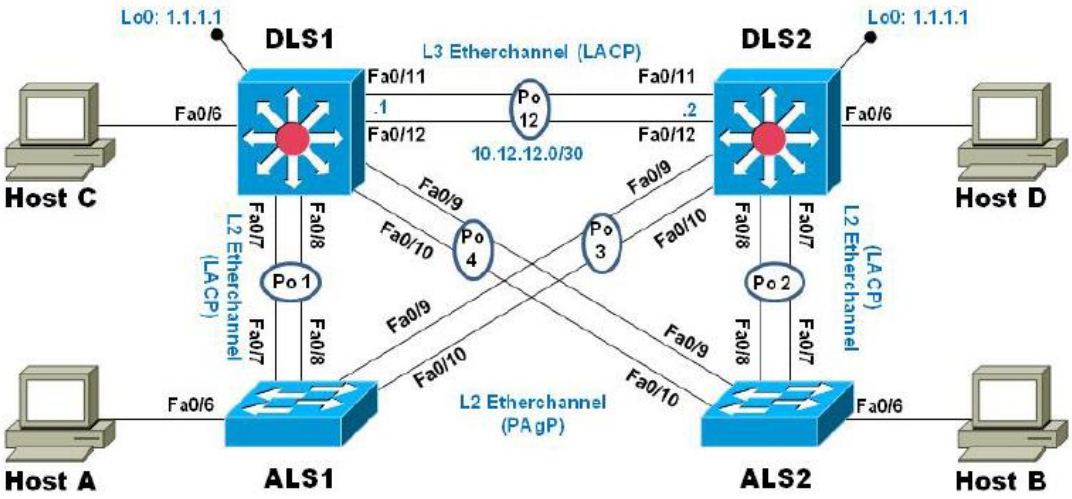

Ilustración 12: Topología de red escenario 2.

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

A. Apagar todas las interfaces en cada switch.
B. Asignar un nombre a cada switch acorde al escenario establecido.

```
Switch>
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DSL1
DSL1(config)#int ran f0/1-24
DSL1(config-if-range)#shutdown
DSL1(config-if-range)#exit
DSL1(config)#
DSL1#
%SYS-5-CONFIG_I: Configured from console by console

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname DSL2
DSL2(config)#int ran f0/1-24
DSL2(config-if-range)#shutdown
DSL2(config-if-range)#exit
DSL2(config)#


Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname ALS1
ALS1(config)#int ran f0/1-24
ALS1(config-if-range)#shutdown
ALS1(config-if-range)#exit
ALS1(config)#

Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname ALS2
ALS2(config)#int ran f0/1-24
ALS2(config-if-range)#shutdown
ALS2(config-if-range)#exit
ALS2(config)#
```

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

1. La conexión entre DLS1 y DLS2 será un EtherChannel capa-3 utilizando LACP. Para DLS1 se utilizará la dirección IP 10.12.12.1/30 y para DLS2 utilizará 10.12.12.2/30.

```
DSL1(config)#int vlan 800
DSL1(config-if)#ip address 10.12.12.1 255.255.255.252
DSL1(config-if)#int ran f0/11-12
DSL1(config-if-range)#channel-protocol lacp
DSL1(config-if-range)#channel-group 12 mode active
DSL1(config-if-range)#
Creating a port-channel interface Port-channel 2

DSL1(config-if-range)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to down
DSL1(config-if-range)#exit
DSL1(config)#

DSL2(config)#int vlan 800
DSL2(config-if)#ip address 10.12.12.2 255.255.255.252
DSL2(config-if)#int ran f0/11-12
DSL2(config-if-range)#channel-protocol lacp
DSL2(config-if-range)#channel-group 12 mode active
DSL2(config-if-range)#
Creating a port-channel interface Port-channel 2

DSL2(config-if-range)#no shutdown


DSL2(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to up

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

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

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

%LINK-5-CHANGED: Interface Port-channel2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state
to up
```

```
DSL2(config-if-range)#exit
DSL2(config)#
```

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

```
DSL1(config)#int ran f0/7-8
DSL1(config-if-range)#channel-protocol lacp
DSL1(config-if-range)#channel-group 1 mode active
DSL1(config-if-range)#no shutdown

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

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


DSL2(config)#int ran f0/7-8
DSL2(config-if-range)#channel-protocol lacp
DSL2(config-if-range)#channel-group 2 mode active
DSL2(config-if-range)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
DSL2(config-if-range)#exit
DSL2(config)#


ALS1(config)#int ran f0/7-8
ALS1(config-if-range)#channel-protocol lacp
ALS1(config-if-range)#channel-group 1 mode active
ALS1(config-if-range)#
Creating a port-channel interface Port-channel 2

ALS1(config-if-range)#no shutdown


ALS1(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up

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

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

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

ALS1(config-if-range)#exit

ALS2(config)#int ran f0/7-8
ALS2(config-if-range)#channel-protocol lacp
ALS2(config-if-range)#channel-group 2 mode active
ALS2(config-if-range)#
Creating a port-channel interface Port-channel 2

ALS2(config-if-range)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to down
ALS2(config-if-range)#exit
ALS2(config)#

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

DSL1(config)#int ran f0/9-10
DSL1(config-if-range)#channel-protocol pagp
DSL1(config-if-range)#channel-group 4 mode desirable
DSL1(config-if-range)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
DSL1(config-if-range)#exit
DSL1(config)#

DSL2(config)#int ran f0/9-10
DSL2(config-if-range)#channel-protocol pagp
DSL2(config-if-range)#channel-group 3 mode desirable
DSL2(config-if-range)#no shutdown

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

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to down
DSL2(config-if-range)#exit
DSL2(config)#

ALS1(config)#int ran f0/9-10
ALS1(config-if-range)#channel-protocol pagp

```
ALS1(config-if-range)#channel-group 3 mode desirable
ALS1(config-if-range)#no shutdown


ALS1(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up

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

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

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

ALS1(config-if-range)#exit
ALS1(config)#
ALS2(config)#int ran f0/9-10
ALS2(config-if-range)#channel-protocol pagp
ALS2(config-if-range)#channel-group 4 mode desirable
ALS2(config-if-range)#no shutdown


ALS2(config-if-range)#
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up

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

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

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

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

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

```
DSL1(config)#int ran f0/7-12
DSL1(config-if-range)#switchport trunk encap dot1q
DSL1(config-if-range)#switchport trunk native vlan 800
DSL1(config-if-range)#switchport mode trunk
DSL1(config-if-range)#switchport nonegotiate
DSL1(config-if-range)#no shutdown
DSL1(config-if-range)#exit
```

```
DSL1(config)#

DSL2>enable
DSL2#config t
Enter configuration commands, one per line. End with CNTL/Z.
DSL2(config)#int ran f0/7-12
DSL2(config-if-range)#switcport trunk en
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/11 (1), with DSL1 FastEthernet0/11 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/12 (1), with DSL1 FastEthernet0/11 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/11 (1), with DSL1 FastEthernet0/12 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/12 (1), with DSL1 FastEthernet0/12 (800).
DSL2(config-if-range)#switchport trunk encap dot1q
DSL2(config-if-range)#switchport trunk native vlan 800
DSL2(config-if-range)#switchport mode trunk
DSL2(config-if-range)#switchport nonegotiate
DSL2(config-if-range)#no shutdown
DSL2(config-if-range)#exit
DSL2(config)#


ALS1#config t
Enter configuration commands, one per line. End with CNTL/Z.
ALS1(config)#int ran f0/7-10
ALS1(config-if-range)#switchport trunk encap dot1q
ALS1(config-if-range)#switchport trunk native vlan 800
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#switchport nonegotiate
ALS1(config-if-range)#no shutdown
ALS1(config-if-range)#exit
ALS1(config)#

ALS2(config)#int ran f0/7-10
ALS2(config-if-range)#switchport trunk encap dot1q
ALS2(config-if-range)#switchport trunk native vlan 800
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#switchport nonegotiate
ALS2(config-if-range)#no shutdown
ALS2(config-if-range)#exit
```

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

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

```
DSL1(config)#vtp mode server
Device mode already VTP SERVER.
DSL1(config)#vtp domain UNAD
Changing VTP domain name from NULL to UNAD
DSL1(config)#vtp password cisco123
Setting device VLAN database password to cisco123
DSL1(config)#exit
DSL1#

ALS1(config)#vtp mode server
Device mode already VTP SERVER.
ALS1(config)#vtp domain UNAD
Changing VTP domain name from NULL to UNAD
ALS1(config)#vtp password cisco123
Setting device VLAN database password to cisco123
ALS1(config)#exit
ALS1#

ALS2(config)#vtp mode server
Device mode already VTP SERVER.
ALS2(config)#vtp domain UNAD
Changing VTP domain name from NULL to UNAD
ALS2(config)#vtp password cisco123
Setting device VLAN database password to cisco123
ALS2(config)#exit
ALS2#
```

2. Configurar DLS1 como servidor principal para las VLAN.

```
DSL1(config)#vtp version 2
DSL1(config)#vtp mode server mst
^
% Invalid input detected at '^' marker.
DSL1(config)#end
DSL1#
```

3. Configurar ALS1 y ALS2 como clientes VTP.

```
ALS1(config)#vtp mode client
Setting device to VTP CLIENT mode.
ALS1(config)#vtp domain UNAD
Domain name already set to UNAD.
ALS1(config)#vtp password cisco123
Setting device VLAN database password to cisco123
```

ALS1(config)#exit

ALS2(config)#vtp mode client
Setting device to VTP CLIENT mode.
ALS2(config)#vtp domain UNAD
Domain name already set to UNAD.
ALS2(config)#vtp password cisco123
Setting device VLAN database password to cisco123
ALS2(config)#exit

E. 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

Tabla 1:Configurar las VLAN.

DSL1(config)#vlan 800
DSL1(config-vlan)#
DSL1(config-vlan)#name NATIVA
DSL1(config-vlan)#exit
DSL1(config)#vlan 12
DSL1(config-vlan)#name EJECUTIVOS
DSL1(config-vlan)#exit
DSL1(config)#vlan 234
DSL1(config-vlan)#name HUESPEDES
DSL1(config-vlan)#exit
DSL1(config)#vlan 434
DSL1(config-vlan)#name ESTACIONAMIENTO
DSL1(config-vlan)#exit
DSL1(config)#
DSL1(config)#vlan 123
DSL1(config-vlan)#name MANTENIMIENTO
DSL1(config-vlan)#exit
DSL1(config)#exit
DSL1(config)#vlan 1111
DSL1(config-vlan)#name VIDEONET
DSL1(config-vlan)#exit
DSL1(config)#vlan 1010
DSL1(config-vlan)#name VOZ

```
DSL1(config-vlan)#exit
DSL1(config)#vlan 3456
DSL1(config-vlan)#name ADMINISTRACION
DSL1(config-vlan)#exit
DSL1(config)#
```

Se crearon todas las VLAN en DSL1 desde el modo VTP transparent

F. En DLS1, suspender la VLAN 434.

```
DSL1(config)#vlan 434
DSL1(config-vlan)#shutdown
^
% Invalid input detected at '^' marker.
DSL1(config-vlan)#state ?
% Unrecognized command
DSL1(config-vlan)#state suspend
^
% Invalid input detected at '^' marker.
DSL1(config-vlan)#name estacionamiento
DSL1(config-vlan)#shutdown
^
% Invalid input detected at '^' marker.
DSL1(config-vlan)#state suspend
^
% Invalid input detected at '^' marker.
DSL1(config-vlan)#
```

En PACKET TRACER las VLAN no se pueden suspender global ni localmente con los comandos stated-suspend y shutdown porque no se reconocen los comandos.

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

```
DSL2(config)#vtp version 2
DSL2(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
DSL2(config)#vlan 800
DSL2(config-vlan)#
%LINK-5-CHANGED: Interface Vlan800, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan800, changed state to up

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

```
DSL2(config)#vlan 12
DSL2(config-vlan)#name EJECUTIVOS
DSL2(config-vlan)#exit
DSL2(config)#vlan 234
DSL2(config-vlan)#name HUESPEDES
DSL2(config-vlan)#exit
DSL2(config)#vlan 123
DSL2(config-vlan)#name MANTENIMIENTO
DSL2(config-vlan)#exit
DSL2(config)#vlan 1111
DSL2(config-vlan)#name VIDEONET
DSL2(config-vlan)#exit
DSL2(config-vlan)#vlan 1010
DSL2(config-vlan)#name VOZ
DSL2(config-vlan)#exit
DSL2(config)#vlan 3456
DSL2(config-vlan)#name ADMINISTRACION
DSL2(config-vlan)#exit
```

H. Suspender VLAN 434 en DLS2.

En PACKET TRACER las VLAN no se pueden suspender global ni localmente con los comandos stated suspend y shut down por que no se reconocen los comandos.

I. 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.

```
DSL2(config)#vlan 567
DSL2(config-vlan)#name CONTABILIDAD
DSL2(config-vlan)#private-vlan isolated
^
% Invalid input detected at '^' marker.
DSL2(config-vlan)#exit
DSL2(config)#vlan 567
DSL2(config-vlan)#private-vlan isolated
^
% Invalid input detected at '^' marker.
```

J. 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.

```
DSL1(config)#spanning-tree vlan 1 root primary
DSL1(config)#spanning-tree vlan 12 root primary
DSL1(config)#spanning-tree vlan 434 root primary
```

```
DSL1(config)#spanning-tree vlan 800 root primary
DSL1(config)#spanning-tree vlan 1010 root primary
DSL1(config)#spanning-tree vlan 1111 root primary
DSL1(config)#spanning-tree vlan 3456 root primary
DSL1(config)#
DSL1(config)#
DSL1(config)#spanning-tree vlan 123 root secondary
DSL1(config)#spanning-tree vlan 234 root secondary
DSL1(config)#
DSL1(config)#
```

K. Configurar DLS2 como Spanning tree root para las VLAN 123 y 234 y como una raíz secundaria para las VLAN 12, 434, 800, 1010, 1111 y 3456.

```
DSL2(config)#spanning-tree vlan 123 root primary
DSL2(config)#spanning-tree vlan 234 root primary
DSL2(config)#
DSL2(config)#
DSL2(config)#spanning-tree vlan 12 root secondary
DSL2(config)#spanning-tree vlan 434 root secondary
DSL2(config)#spanning-tree vlan 800 root secondary
DSL2(config)#spanning-tree vlan 1010 root secondary
DSL2(config)#spanning-tree vlan 1111 root secondary
DSL2(config)#spanning-tree vlan 3456 root secondary
DSL2(config)#
DSL2(config)#
```

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

```
DSL1(config)#int ran f0/7-12
DSL1(config-if-range)#switchport trunk encapsulation dot1q
DSL1(config-if-range)#switchport trunk native vlan 800
DSL1(config-if-range)#switchport mode trunk
DSL1(config-if-range)#
DSL1(config-if-range)#exit
DSL1(config)#
DSL2(config)#int ran f0/7-12
DSL2(config-if-range)#switchport trunk encapsulation dot1q
DSL2(config-if-range)#switchport trunk native vlan 800
DSL2(config-if-range)#switchport mode trunk
DSL2(config-if-range)#exit
DSL2(config)#
ALS1(config)#int ran f0/7-12
```

```
ALS1(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS1(config-if-range)#switchport trunk native vlan 800
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#exit
ALS1(config)#

ALS2(config)#int ran f0/7-12
ALS2(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
ALS2(config-if-range)#switchport trunk native vlan 800
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#
ALS2(config-if-range)#exit

DSL1(config)#int ran f0/7-12
DSL1(config-if-range)#switchport mode trunk
DSL1(config-if-range)#
DSL1(config-if-range)#switchport trunk native vlan 800
DSL1(config-if-range)#switchport trunk native vlan 12
DSL1(config-if-range)#switchport trunk native vlan 234
DSL1(config-if-range)#switchport trunk native vlan 1111
DSL1(config-if-range)#switchport trunk native vlan 434
DSL1(config-if-range)#switchport trunk native vlan 123
DSL1(config-if-range)#switchport trunk native vlan 1010
DSL1(config-if-range)#switchport trunk native vlan 3456
DSL1(config-if-range)#switchport nonegotiate

DSL2(config)#int ran f0/7-12
DSL2(config-if-range)#switchport mode trunk
DSL2(config-if-range)#
DSL2(config-if-range)#switchport trunk native vlan 800
DSL2(config-if-range)#switchport trunk native vlan 12
DSL2(config-if-range)#switchport trunk native vlan 234
DSL2(config-if-range)#switchport trunk native vlan 1111
DSL2(config-if-range)#switchport trunk native vlan 434
DSL2(config-if-range)#switchport trunk native vlan 123
DSL2(config-if-range)#switchport trunk native vlan 1010
DSL2(config-if-range)#switchport trunk native vlan 3456
DSL2(config-if-range)#switchport nonegotiate

ALS1(config)#int ran f0/7-12
ALS1(config-if-range)#switchport mode trunk
ALS1(config-if-range)#
ALS1(config-if-range)#switchport trunk native vlan 800
ALS1(config-if-range)#switchport trunk native vlan 12
ALS1(config-if-range)#switchport trunk native vlan 234
```

```
ALS1(config-if-range)#switchport trunk native vlan 1111
ALS1(config-if-range)#switchport trunk native vlan 434
ALS1(config-if-range)#switchport trunk native vlan 123
ALS1(config-if-range)#switchport trunk native vlan 1010
ALS1(config-if-range)#switchport trunk native vlan 3456
ALS1(config-if-range)#switchport nonegotiate

ALS2(config)#int ran f0/7-12
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#
ALS2(config-if-range)#switchport trunk native vlan 800
ALS2(config-if-range)#switchport trunk native vlan 12
ALS2(config-if-range)#switchport trunk native vlan 234
ALS2(config-if-range)#switchport trunk native vlan 1111
ALS2(config-if-range)#switchport trunk native vlan 434
ALS2(config-if-range)#switchport trunk native vlan 123
ALS2(config-if-range)#switchport trunk native vlan 1010
ALS2(config-if-range)#switchport trunk native vlan 3456
ALS2 (config-if-range)#switchport nonegotiate
ALS2(config)#
```

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

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

Tabla 2: Puertos acceso VLAN.

```
DSL1(config-if-range)#switchport nonegotiate
DSL1(config-if-range)#exit
DSL1(config)#int f0/6
DSL1(config-if)#switchport access vlan 3456
DSL1(config-if)#no shutdown
DSL1(config-if)#int f0/15
DSL1(config-if)#switchport access vlan 1111
DSL1(config-if)#no shutdown
DSL1(config-if)#exit
DSL1(config)#

DSL2(config)#int f0/6
DSL2(config-if)#switchport access vlan 12
```

```
DSL2(config-if)#switchport access vlan 101
% Access VLAN does not exist. Creating vlan 101
DSL2(config-if)#switchport access vlan 1010
DSL2(config-if)#no shutdown
DSL2(config-if)#exit
DSL2(config-if)#int f0/15
DSL2(config-if)#switchport access vlan 1111
DSL2(config-if)#no shutdown
DSL2(config-if)#exit
DSL2(config)#int ran f0/16-18
DSL2(config-if-range)#switchport access vlan 567
DSL2(config-if-range)#no shutdown
DSL2(config-if-range)#exit
DSL2(config)#

ALS1(config)#int f0/6
ALS1(config-if)#switchport access vlan 123
ALS1(config-if)#switchport access vlan 1010
ALS1(config-if)#no shutdown
ALS1(config-if)#exit
ALS1(config)#int f0/15
ALS1(config-if)#switchport access vlan 1111
ALS1(config-if)#no shutdown
ALS1(config-if)#exit
ALS1(config)#

ALS2(config)#int f0/6
ALS2(config-if)#switchport access vlan 234
ALS2(config-if)#no shutdown
ALS2(config-if)#exit
ALS2(config)#int f0/15
ALS2(config-if)#switchport access vlan 1111
ALS2(config-if)#no shutdown
ALS2(config-if)#exit
ALS2(config)#
```

Parte 2: de red de prueba y las opciones configuradas.

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

A

```
DSL1#
DSL1#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- ---------
-------------------------------
1    default                           active    Po1, Po4, Po12, Fa0/1
                                                 Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                                 Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                 Fa0/11, Fa0/12, Fa0/13,
Fa0/14
                                                 Fa0/16, Fa0/17, Fa0/18,
Fa0/19
                                                 Fa0/20, Fa0/21, Fa0/22,
Fa0/23
                                                 Fa0/24, Gig0/1, Gig0/2
12   EJECUTIVOS                        active
123  MANTENIMIENTO                     active
234  HUESPEDES                         active
434  ESTACIONAMIENTO                   active
800  NATIVA                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
1010 VOZ                               active
1111 VIDEONET                          active    Fa0/15
3456 ADMINISTRACION                    active    Fa0/6

 --More--
```

Ilustración 13: Vlans y enlaces troncales DSL1 (1)

```
1111 VIDEONET                            active    Fa0/15
3456 ADMINISTRACION                      active    Fa0/6

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1
Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------
------
1    enet  100001     1500  -      -      -        -    -        0      0
12   enet  100012     1500  -      -      -        -    -        0      0
123  enet  100123     1500  -      -      -        -    -        0      0
234  enet  100234     1500  -      -      -        -    -        0      0
434  enet  100434     1500  -      -      -        -    -        0      0
800  enet  100800     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1
Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------
------
1010 enet  101010     1500  -      -      -        -    -        0      0
1111 enet  101111     1500  -      -      -        -    -        0      0
3456 enet  103456     1500  -      -      -        -    -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------
---

Primary Secondary Type              Ports
------- --------- -----------------
------------------------------------------

DSL1#
DSL1#
DSL1#
```

Ilustración 14: Vlans y enlaces troncales DSL1 (2)

```
DSL2(config)#exit
DSL2#
%SYS-5-CONFIG_I: Configured from console by console
show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Po2, Po3, Fa0/1, Fa0/2
                                                Fa0/3, Fa0/4, Fa0/5, Fa0/7
                                                Fa0/8, Fa0/9, Fa0/10, Fa0/11
                                                Fa0/12, Fa0/13, Fa0/14, Fa0/19
                                                Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                                Fa0/24, Gig0/1, Gig0/2
12   EJECUTIVOS                       active
101  VLAN0101                         active
123  MANTENIMIENTO                    active
234  HUESPEDES                        active
434  ESTACIONAMIENTO                  active
567  CONTABILIDAD                     active    Fa0/16, Fa0/17, Fa0/18
800  NATIVA                           active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
1010 VOZ                              active    Fa0/6
1111 VIDEONET                         active    Fa0/15
3456 ADMINISTRACION                   active

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

Ilustración 15: Vlans y enlaces troncales DLS2 (1)

```
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
12   enet  100012     1500  -      -      -        -    -        0      0
101  enet  100101     1500  -      -      -        -    -        0      0
123  enet  100123     1500  -      -      -        -    -        0      0
234  enet  100234     1500  -      -      -        -    -        0      0
434  enet  100434     1500  -      -      -        -    -        0      0
567  enet  100567     1500  -      -      -        -    -        0      0
800  enet  100800     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1010 enet  101010     1500  -      -      -        -    -        0      0
1111 enet  101111     1500  -      -      -        -    -        0      0
3456 enet  103456     1500  -      -      -        -    -        0      0

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
DSL2#
DSL2#
```

Ilustración 16: Vlans y enlaces troncales DSL2 (2)

```
ALS1#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Po1, Fa0/1, Fa0/2, Fa0/3
                                                Fa0/4, Fa0/5, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/16, Fa0/17
                                                Fa0/18, Fa0/19, Fa0/20, Fa0/21
                                                Fa0/22, Fa0/23, Fa0/24, Gig0/1
                                                Gig0/2
12   EJECUTIVOS                       active
123  MANTENIMIENTO                    active
234  HUESPEDES                        active
434  ESTACIONAMIENTO                  active
800  NATIVA                           active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
```

Ilustración 17: Vlans y enlaces troncales ALS1 (1)

```
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
12   enet  100012     1500  -      -      -        -    -        0      0
123  enet  100123     1500  -      -      -        -    -        0      0
234  enet  100234     1500  -      -      -        -    -        0      0
434  enet  100434     1500  -      -      -        -    -        0      0
800  enet  100800     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

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

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
ALS1#
ALS1#
ALS1#
```

Ilustración 18: Vlans y enlaces troncales ALS1(2)

```
show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Po2, Po4, Fa0/1, Fa0/2
                                                Fa0/3, Fa0/4, Fa0/5, Fa0/11
                                                Fa0/12, Fa0/13, Fa0/14, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
12   EJECUTIVOS                       active
123  MANTENIMIENTO                    active
234  HUESPEDES                        active    Fa0/6
434  ESTACIONAMIENTO                  active
800  NATIVA                           active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
12   enet  100012     1500  -      -      -        -    -        0      0
```

Ilustración 19: Vlans y enlaces troncales ALS2(1)

```
VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
12   enet  100012     1500  -      -      -        -    -        0      0
123  enet  100123     1500  -      -      -        -    -        0      0
234  enet  100234     1500  -      -      -        -    -        0      0
434  enet  100434     1500  -      -      -        -    -        0      0
800  enet  100800     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0

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

Remote SPAN VLANs
------------------------------------------------------------------------------

Primary Secondary Type              Ports
------- --------- ----------------- ------------------------------------------
ALS2#
```

Ilustración 20: Vlans y enlaces troncales ALS2(2)

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

DSL1

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Port-channels: 1 Max Portchannels = 1
Protocol:   PAGP
DSL1#
DSL1#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


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

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------

1      Po1(SD)           LACP    Fa0/7(s) Fa0/8(s)
4      Po4(SD)           PAgP    Fa0/9(s) Fa0/10(s)
12     Po12(SD)           LACP    Fa0/11(s) Fa0/12(s)
DSL1#
```

Ilustración 21: Show etherchannel DSL1

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


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------

1      Po1(SD)           LACP    Fa0/7(I) Fa0/8(I)
ALS1#
ALS1#
ALS1#show etherchannel
                Channel-group listing:
                ----------------------

Group: 1
----------
Group state = L2
Ports: 2 Maxports = 16
Port-channels: 1 Max Port-channels = 16
Protocol:   LACP
ALS1#
```

Ilustración 22: Show etherchannel ALS1

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

```
DSL1#show spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    24577
              Address     0090.2B0A.E78D
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    24577  (priority 24576 sys-id-ext 1)
              Address     0090.2B0A.E78D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 23: DSL1-VLAN0001

```
VLAN0012
  Spanning tree enabled protocol ieee
  Root ID    Priority    24588
             Address     0090.2B0A.E78D
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    24588  (priority 24576 sys-id-ext 12)
             Address     0090.2B0A.E78D
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 24: DSL1-VLAN0012

```
VLAN0123
  Spanning tree enabled protocol ieee
  Root ID    Priority    24699
             Address     0007.EC07.7363
             Cost        19
             Port        11(FastEthernet0/11)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    28795  (priority 28672 sys-id-ext 123)
             Address     0090.2B0A.E78D
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

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

Ilustración 25: DSL1-VLAN0123

```
VLAN0234
  Spanning tree enabled protocol ieee
  Root ID     Priority    24810
              Address     0007.EC07.7363
              Cost        19
              Port        11(FastEthernet0/11)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    28906  (priority 28672 sys-id-ext 234)
              Address     0090.2B0A.E78D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

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

Ilustración 26: DSL1-VLAN0234

```
VLAN0434
  Spanning tree enabled protocol ieee
  Root ID     Priority    25010
              Address     0090.2B0A.E78D
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    25010  (priority 24576 sys-id-ext 434)
              Address     0090.2B0A.E78D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 27: DSL1-VLAN0434

```
VLAN0800
  Spanning tree enabled protocol ieee
  Root ID     Priority    25376
              Address     0090.2B0A.E78D
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    25376  (priority 24576 sys-id-ext 800)
              Address     0090.2B0A.E78D
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 28: DSL1-VLAN0800

```
DSL1#show spanning-tree summary
Switch is in pvst mode
Root bridge for: default EJECUTIVOS ESTACIONAMIENTO NATIVA
Extended system ID           is enabled
Portfast Default             is disabled
PortFast BPDU Guard Default  is disabled
Portfast BPDU Filter Default is disabled
Loopguard Default            is disabled
EtherChannel misconfig guard is disabled
UplinkFast                   is disabled
BackboneFast                 is disabled
Configured Pathcost method used is short

Name                   Blocking Listening Learning Forwarding STP Active
---------------------- -------- --------- -------- ---------- ----------
VLAN0001                    0         0        0          6          6
VLAN0012                    0         0        0          6          6
VLAN0123                    1         0        0          5          6
VLAN0234                    1         0        0          5          6
VLAN0434                    0         0        0          6          6
VLAN0800                    0         0        0          6          6

---------------------- -------- --------- -------- ---------- ----------
6 vlans                     2         0        0         34         36

DSL1#
```

Ilustración 29: DSL1 Show spanning-tree

```
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    24577
              Address     0090.2B0A.E78D
              Cost        19
              Port        11(FastEthernet0/11)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    28673  (priority 28672 sys-id-ext 1)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

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

Ilustración 30: DSL2-VLAN0001

```
VLAN0012
  Spanning tree enabled protocol ieee
  Root ID     Priority    24588
              Address     0090.2B0A.E78D
              Cost        19
              Port        11(FastEthernet0/11)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    28684  (priority 28672 sys-id-ext 12)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

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

Ilustración 31: DSL2-VLAN0012

```
VLAN0123
  Spanning tree enabled protocol ieee
  Root ID     Priority    24699
              Address     0007.EC07.7363
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    24699  (priority 24576 sys-id-ext 123)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 32: DSL2-VLAN0123

```
VLAN0234
  Spanning tree enabled protocol ieee
  Root ID     Priority    24810
              Address     0007.EC07.7363
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    24810  (priority 24576 sys-id-ext 234)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 33:DSL2-VLAN0234

```
VLAN0434
  Spanning tree enabled protocol ieee
  Root ID     Priority    25010
              Address     0090.2B0A.E78D
              Cost        19
              Port        11(FastEthernet0/11)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    29106  (priority 28672 sys-id-ext 434)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

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

Ilustración 34: DSL2-VLAN0434

```
VLAN0567
  Spanning tree enabled protocol ieee
  Root ID     Priority    33335
              Address     0007.EC07.7363
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    33335  (priority 32768 sys-id-ext 567)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Fa0/10           Desg FWD 19        128.10   P2p
Fa0/11           Desg FWD 19        128.11   P2p
Fa0/12           Desg FWD 19        128.12   P2p
```

Ilustración 35: DSL2-VLAN0567

```
VLAN0800
  Spanning tree enabled protocol ieee
  Root ID     Priority    25376
              Address     0090.2B0A.E78D
              Cost        19
              Port        11(FastEthernet0/11)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    29472  (priority 28672 sys-id-ext 800)
              Address     0007.EC07.7363
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

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

Ilustración 36: DSL2-VLAN0800

```
DSL2#show spanning-tree ?
  active     Report on active interfaces only
  detail     Detailed information
  interface  Spanning Tree interface status and configuration
  summary    Summary of port states
  vlan       VLAN Switch Spanning Trees
  <cr>
DSL2#show spanning-tree summary
Switch is in pvst mode
Root bridge for: VLAN0101 MANTENIMIENTO HUESPEDES CONTABILIDAD
Extended system ID           is enabled
Portfast Default             is disabled
PortFast BPDU Guard Default  is disabled
Portfast BPDU Filter Default is disabled
Loopguard Default            is disabled
EtherChannel misconfig guard is disabled
UplinkFast                   is disabled
BackboneFast                 is disabled
Configured Pathcost method used is short

Name                   Blocking Listening Learning Forwarding STP Active
---------------------- -------- --------- -------- ---------- ----------
VLAN0001                      1         0        0          5          6
VLAN0012                      1         0        0          5          6
VLAN0101                      0         0        0          6          6
VLAN0123                      0         0        0          6          6
VLAN0234                      0         0        0          6          6
VLAN0434                      1         0        0          5          6
VLAN0567                      0         0        0          6          6
VLAN0800                      1         0        0          5          6

---------------------- -------- --------- -------- ---------- ----------
8 vlans                       4         0        0         44         48
```

Ilustración 37: DSL2 show spanning-tree

CONCLUSIONES

De acuerdo con la implementación de los protocolos EIGRP, OSPF, en el primer escenario se pudo constatar que brindan una solución a los ejercicios planteados en las pruebas de habilidades.

De igual manera, se evidenció que las listas de acceso permiten realizar configuraciones de seguridad para evitar accesos no autorizados y controlar el tráfico dentro de la red.

En cuanto al segundo escenario, la herramienta de simulación packet tracer crea ambientes muy similares a la realidad y permite una simulación en tiempo real.

Así mismo, se identifica que al realizar la creación de VLAN's e implementar protocolos como STP de manera correcta dentro del escenario, se simplifican las tareas, lo que al mismo tiempo maximiza la capacidad de funcionamiento y rendimiento de los dispositivos.

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