Trabajo final
Prueba de habilidades CCNP

Presentado por
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Grupo: 208014_1

Nombre del Curso
Diplomado de Profundizacion Cisco CCNP

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CONTENIDO

GLOSARIO

IPV4: El Protocolo de Internet versión 4, en inglés: Internet Protocol version 4 (IPv4), es la cuarta versión del Internet Protocol (IP). Es uno de los protocolos centrales de los métodos estándares de interconexión de redes basados en Internet, y fue la primera versión implementada para la producción de ARPANET, en 1983.
IPV6: IPv6 es la versión 6 del Protocolo de Internet (IP por sus siglas en inglés, Internet Protocol), es el encargado de dirigir y encaminar los paquetes en la red, fue diseñado en los años 70 con el objetivo de interconectar redes.
INTERFAZ: es la conexión entre dos ordenadores o máquinas de cualquier tipo dando una comunicación entre distintos niveles**.**
CCNP: Certificación en Routing y Switching, expedida por la compañía CISCO

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

OSPF: Camino más cortó abierto; protocolo de enrutamiento que proporciona la ruta más corta.

VLAN: Red Virtual de Área Local; arreglo lógico que distingue un conjunto de paquetes de otros independizándolos.

DHCP: Configuración Dinámica de protocolos para host; encargado de proveer de direccionamiento IP a dispositivos de forma automática.

EtherChannel: Arreglo Lógico para la agrupación de varios enlaces físicos de forma que se suman sus velocidades obteniendo un enlace troncal de alta velocidad.

INTRODUCCIÓN

Las tecnologías de la información y la comunicación hacen parte de una de las herramientas más importantes en el mundo debido a la capacidad de transmisión de datos en tiempo real, en el siglo XXI ha crecido numerablemente las aplicaciones en la industria, la telefonía móvil, entre otras.

Cisco como empresa encargada de brindar conocimientos en redes y comunicación capacita a estudiantes de distintas ingenierías con el fin de que puedan salir de su etapa como universitario con un nuevo conocimiento en una tecnología que avanza a pasos agigantados.

El presente trabajo tiene como finalidad fusionar los cursos de CCNA y CCNP de CISCO, por medio de la solución de dos escenarios de implementación de redes de datos con la ayuda de dispositivos activos Router y Switch simulados en herramientas como Packet Tracer y GNS3. En primera instancia tendremos un primer escenario donde se 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.

Para la segunda parte tendremos un segundo escenario en el cual se 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.

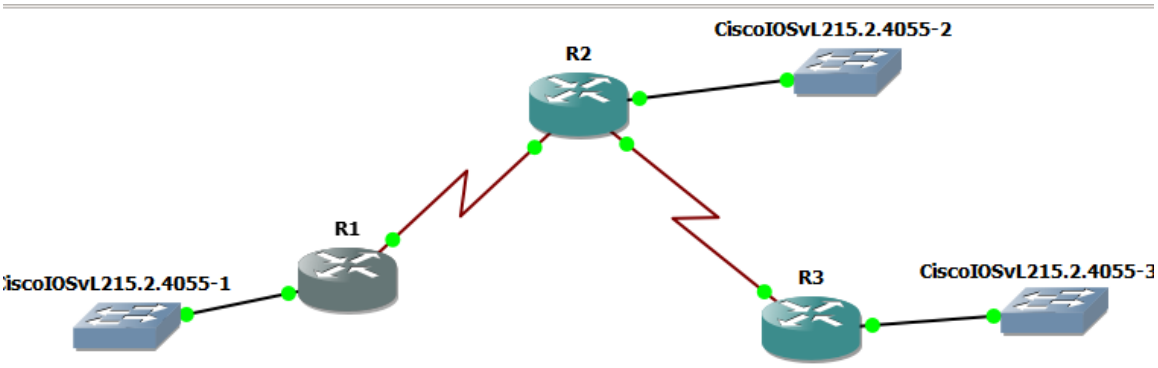
OBJETIVOS

- Configurar los parámetros iniciales a los dispositivos switch y routesr.
- Usar protocolos EIGRP, OSPF, para la configuración y enrutamiento de datos a través de routers y switches con el fin de controlar la red inicial y final.
- Configuración de switchs con protocolos Etherchannel para el uso de VLANs, VTP y Port-Channels.
- Configurar las familias de direcciones OSPFv3 para IPv4 e IPv6.
- Propagar rutas por defecto de IPv4 e IPv6, al interior del dominio OSPFv3.
- Realizar la configuración del protocolo EIGRP para IPv4 como IPv6.
- Configurar la redistribución mutua entre OSPF y EIGRP para IPv4 e IPv6.
- Realizar configuración del escenario número 2, propuesto por la prueba de habilidades CCNP.
- Configurar puertos troncales y Port-channels (LACP y PAgP).
- Configurar VTP versión 3
- Configurar Spanning tree root para las VLAN
- Configurar HSRP con interfaz tracking para VLAN.

ESCENARIO 1 DE HABILIDADES PRÁCTICAS

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.

Topología De Red



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

Configuración del escenario propuesto

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

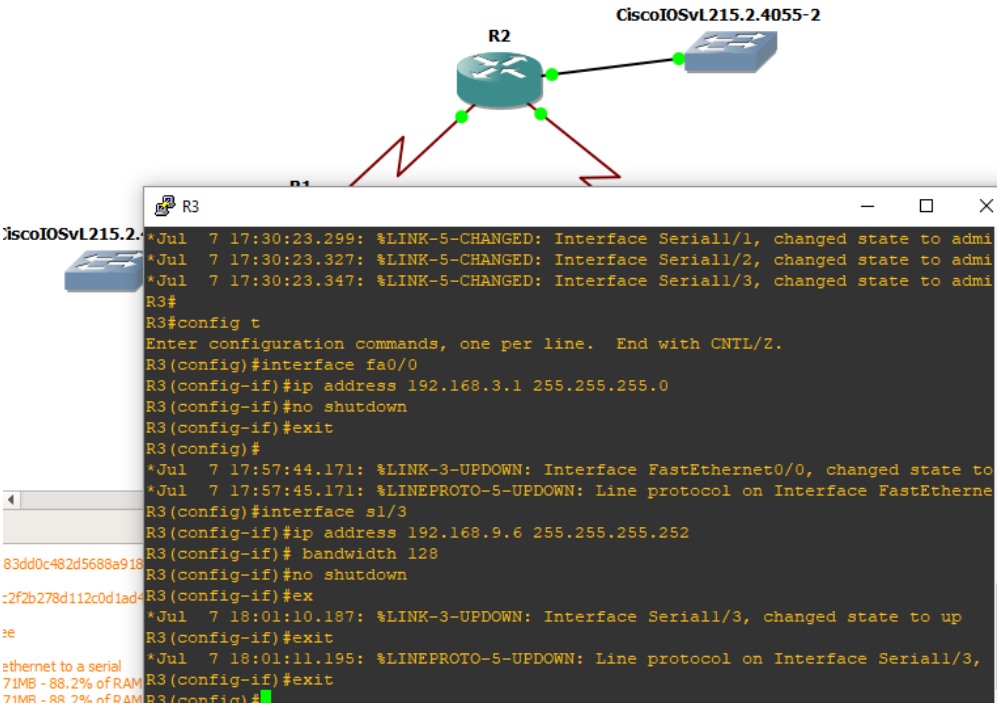
2. Ajustar el ancho de banda a 128 kbps sobre cada uno de los enlaces seriales ubicados en R1, R2, y R3 y ajustar la velocidad de reloj de las conexiones de DCE según sea apropiado.

R1

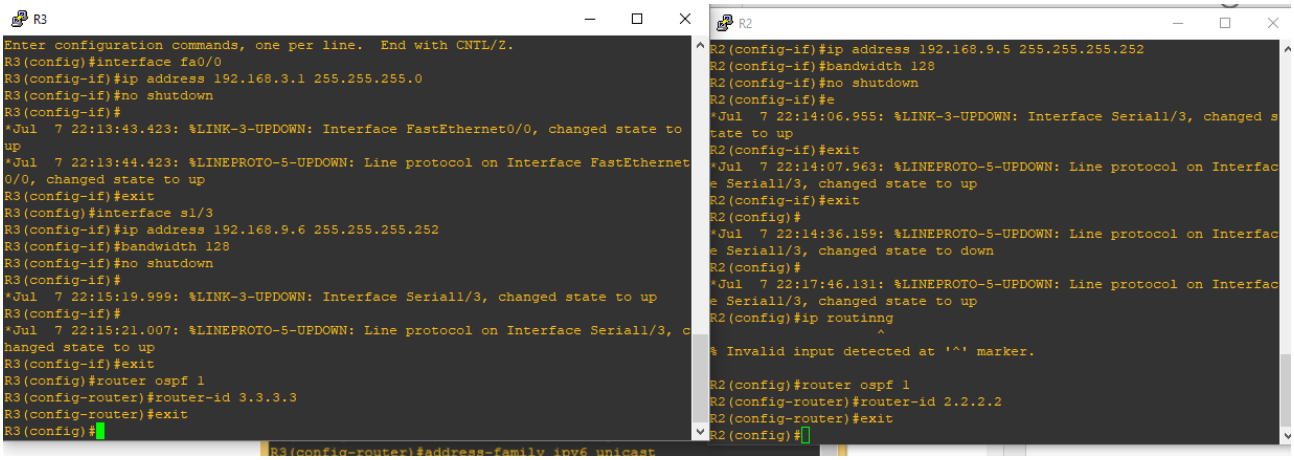
```
R1#
*Jul  7 17:47:46.407: %SYS-5-CONFIG_I: Configured from console by console
R1#vlan brief
     ^
% Invalid input detected at '^' marker.

R1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface fa0/0
R1(config-if)#ip address 192.168.110.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#ex
*Jul  7 17:50:09.819: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Jul  7 17:50:10.819: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#exit
R1(config)#interface s1/0
R1(config-if)#ip address 192.168.9.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#bandwidth 128
R1(config-if)#exit
R1(config)#
```

R2

```
*Jul  7 17:30:55.339: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
*Jul  7 17:30:55.343: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Jul  7 17:30:55.347: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Jul  7 17:30:56.539: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state to administratively down
*Jul  7 17:30:56.547: %LINK-5-CHANGED: Interface Serial1/0, changed state to administratively down
*Jul  7 17:30:56.571: %LINK-5-CHANGED: Interface Serial1/1, changed state to administratively down
*Jul  7 17:30:56.595: %LINK-5-CHANGED: Interface Serial1/2, changed state to administratively down
*Jul  7 17:30:56.599: %LINK-5-CHANGED: Interface Serial1/3, changed state to administratively down
R2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface fa0/0
R2(config-if)#ip address 192.168.2.1 255.255.255.0
R2(config-if)#no swutdown
                ^
% Invalid input detected at '^' marker.

R2(config-if)#no shutdown
R2(config-if)#e
*Jul  7 17:49:33.687: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Jul  7 17:49:34.687: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R2(config-if)#exit
R2(config)#interface s1/0
R2(config-if)#ip address 192.168.9.2 255.255.255.252
R2(config-if)#bandwidth 128
R2(config-if)#no shutdown
R2(config-if)#
*Jul  7 17:52:57.263: %LINK-3-UPDOWN: Interface Serial1/0, changed state to up
R2(config-if)#
*Jul  7 17:52:58.271: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
R2(config-if)#exit
R2(config)#
*Jul  7 17:53:25.203: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to down
R2(config)#interface s1/3
R2(config-if)#ip address 192.168.9.5 255.255.255.252
R2(config-if)#bandwidth 128
R2(config-if)#no shutdown
R2(config-if)#
*Jul  7 17:57:42.511: %LINK-3-UPDOWN: Interface Serial1/3, changed state to up
R2(config-if)#
*Jul  7 17:57:43.519: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to up
R2(config-if)#
*Jul  7 17:58:05.207: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/3, changed state to down
R2(config-if)#exit
R2(config)#
```

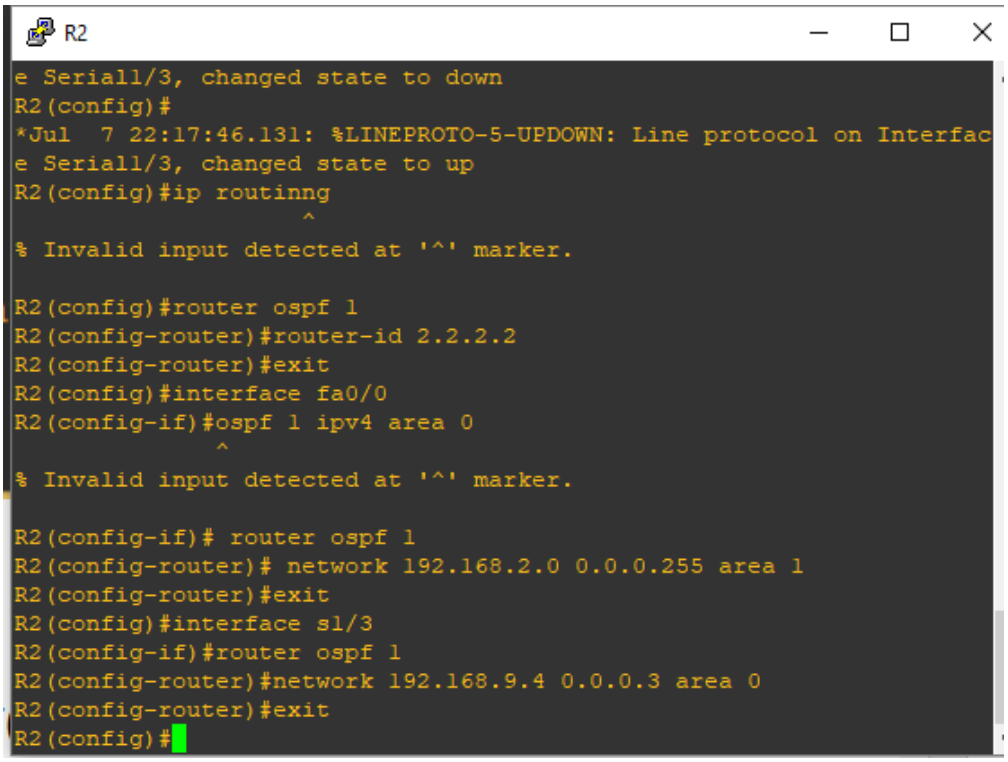


3. En R2 y R3 configurar las familias de direcciones OSPFv3 para IPv4 e IPv6. Utilice el identificador de enrutamiento 2.2.2.2 en R2 y 3.3.3.3 en R3 para ambas familias de direcciones.

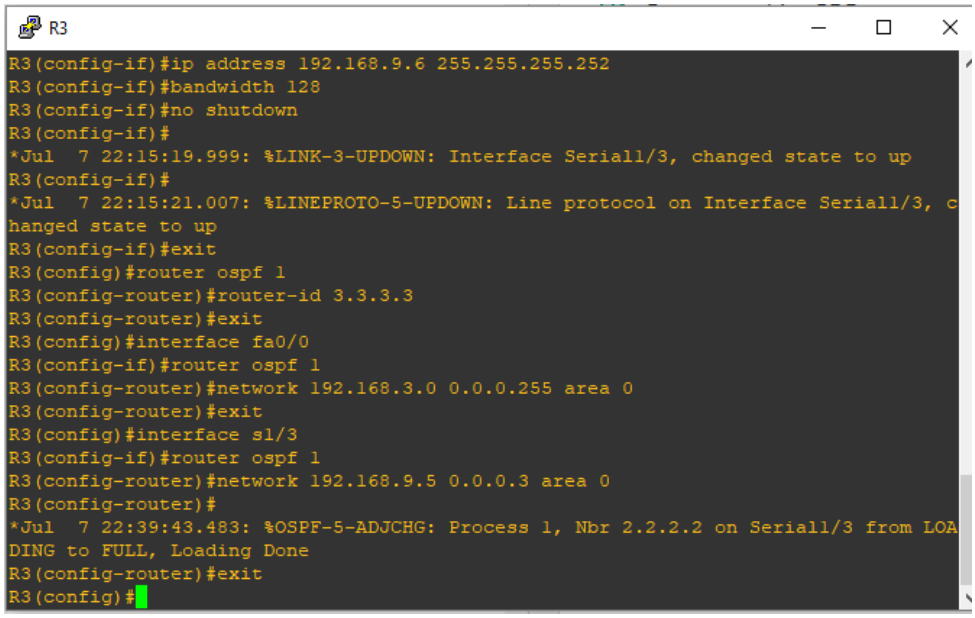


4. En R2, configurar la interfaz F0/0 en el área 1 de OSPF y la conexión serial entre

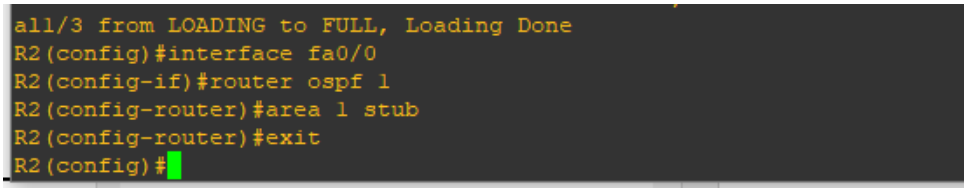
R2 y R3 en OSPF área 0.



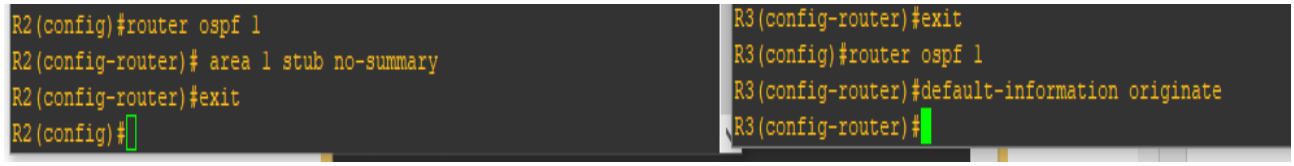
5. En R3, configurar la interfaz F0/0 y la conexión serial entre R2 y R3 en OSPF área 0.



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



7. 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.



8. 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.

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

R1

```
R1(config-if)#bandwidth 128
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#
*Jul  7 22:10:35.527: %LINK-3-UPDOWN: Interface Serial1/0, changed
state to up
R1(config)#
*Jul  7 22:10:36.535: %LINEPROTO-5-UPDOWN: Line protocol on Interfa
ce Serial1/0, changed state to up
R1(config)#
*Jul  7 22:10:57.191: %LINEPROTO-5-UPDOWN: Line protocol on Interfa
ce Serial1/0, changed state to down
R1(config)#
*Jul  7 22:15:07.167: %LINEPROTO-5-UPDOWN: Line protocol on Interfa
ce Serial1/0, changed state to up
R1(config)#router eigrp MTB-S
R1(config-router)#router eigrp MTB-STACK
R1(config-router)#address-family ipv4 autonomous-system 1
R1(config-router-af)#af-interface fa0/0
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)#
```

R2

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

R2(config)#router eigrp B
R2(config-router)#router B
% Incomplete command.

R2(config)#router eigrp B
R2(config-router)#router eigrp DUAL-STACK
R2(config-router)#address-family ipv4 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 ipv4 autonomous-system 4
R2(config-router-af)#af-interface s1/3
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
                                    ^
% Invalid input detected at '^' marker.

R2(config-router-af)#eigrp router-id 2.2.2.2
R2(config-router-af)#exit-address-family
R2(config-router)#exit
R2(config)#exit
R2#
*Jul  7 23:17:26.475: %SYS-5-CONFIG_I: Configured from console by console
R2#
```

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

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

```
R2(config-router-af)#eigrp router-id 2.2.2.2
R2(config-router-af)#exit-address-family
R2(config-router)#exit
R2(config)#exit
R2#
*Jul  7 23:17:26.475: %SYS-5-CONFIG_I: Configured from console
R2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router eigrp DUAL-STACK
R2(config-router)#address-family ipv4 autonomous-system 4
R2(config-router-af)#topology base
R2(config-router-af-topology)#distribute-list R3-to-R1 out
R2(config-router-af-topology)#redistribute ospf 1 metr
% Incomplete command.

R2(config-router-af-topology)#redistribute ospf 1 metric 10000
100 255 1 1500
R2(config-router-af-topology)#exit-af-topology
R2(config-router-af)#exit
R2(config-router)#exit
R2(config)#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)#exit
R2(config)#exit
R2#
*Jul  7 23:29:22.503: %SYS-5-CONFIG_I: Configured from console
by console
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.

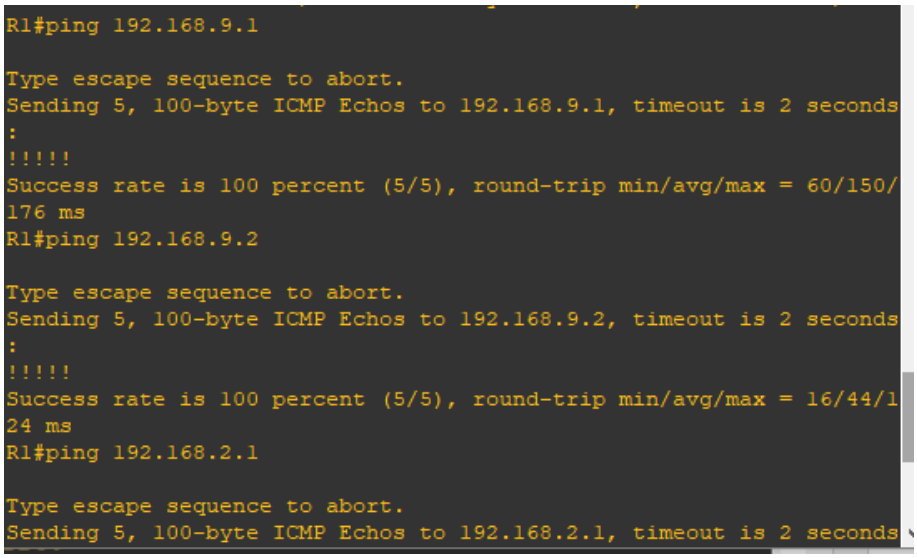
b.TABLAS DE ENRUTAMIENTO EN IPV4.

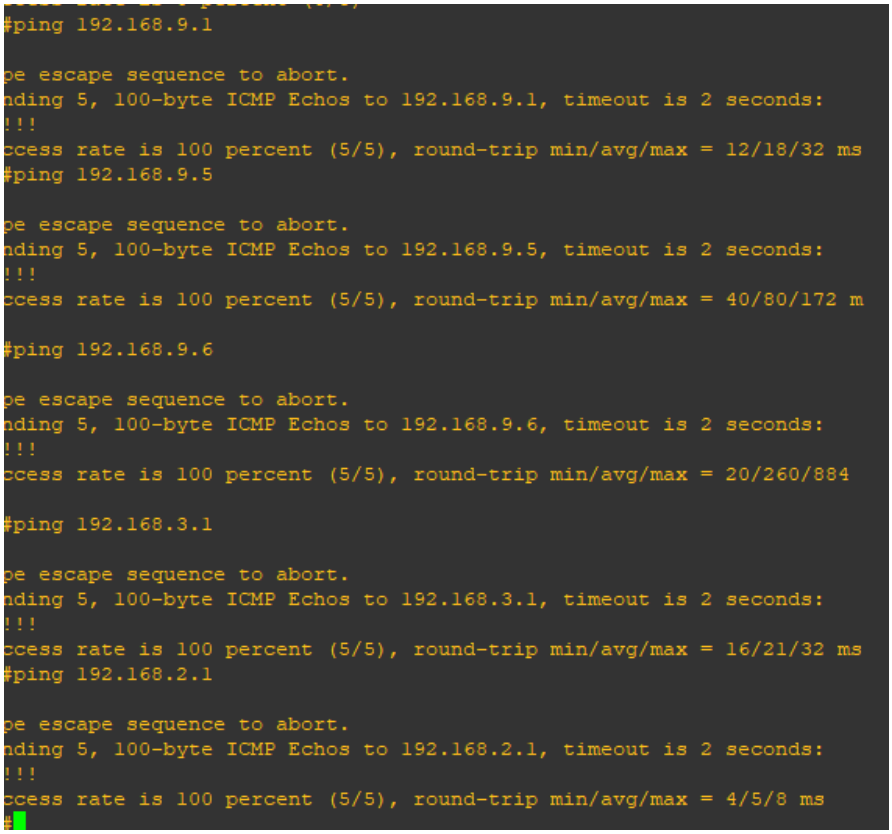
```
onsole
R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B
 - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter ar
ea
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type
 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-I
S level-2
       ia - IS-IS inter area, * - candidate default, U - per-user s
tatic route
       o - ODR, P - periodic downloaded static route, + - replicate
d route

Gateway of last resort is not set

      192.168.9.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.9.0/30 is directly connected, Serial1/0
L        192.168.9.1/32 is directly connected, Serial1/0
      192.168.110.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.110.0/24 is directly connected, FastEthernet0/0
L        192.168.110.1/32 is directly connected, FastEthernet0/0
R1#
```

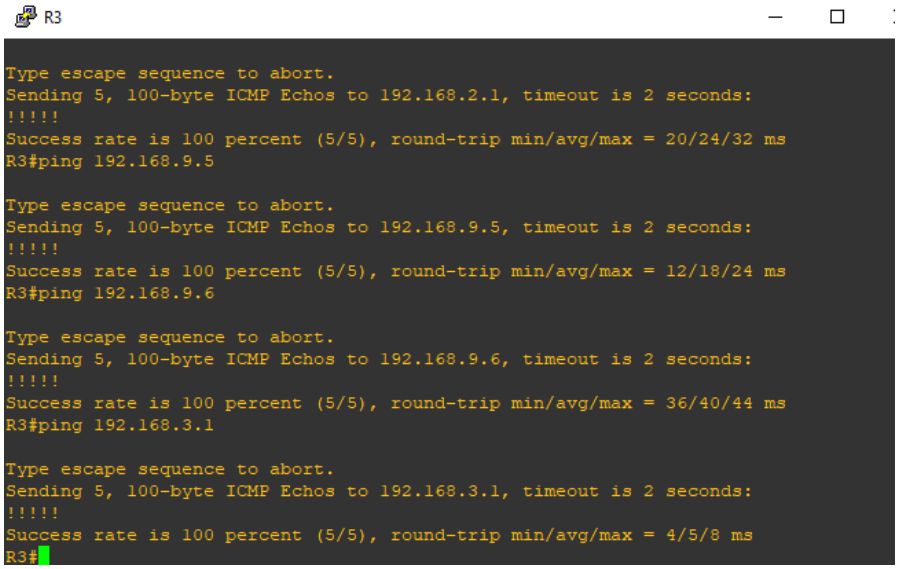
```
R2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - B
GP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS le
vel-2
       ia - IS-IS inter area, * - candidate default, U - per-user stati
c route
       o - ODR, P - periodic downloaded static route, + - replicated ro
ute

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, FastEthernet0/0
L        192.168.2.1/32 is directly connected, FastEthernet0/0
O     192.168.3.0/24 [110/782] via 192.168.9.6, 00:43:39, Serial1/3
      192.168.9.0/24 is variably subnetted, 4 subnets, 2 masks
C        192.168.9.0/30 is directly connected, Serial1/0
L        192.168.9.2/32 is directly connected, Serial1/0
C        192.168.9.4/30 is directly connected, Serial1/3
L        192.168.9.5/32 is directly connected, Serial1/3
R2#
```

```
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, + - replicated route

Gateway of last resort is not set

O IA  192.168.2.0/24 [110/782] via 192.168.9.5, 00:53:27, Serial1/3
      192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.3.0/24 is directly connected, FastEthernet0/0
L        192.168.3.1/32 is directly connected, FastEthernet0/0
      192.168.9.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.9.4/30 is directly connected, Serial1/3
L        192.168.9.6/32 is directly connected, Serial1/3
R3#
```

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







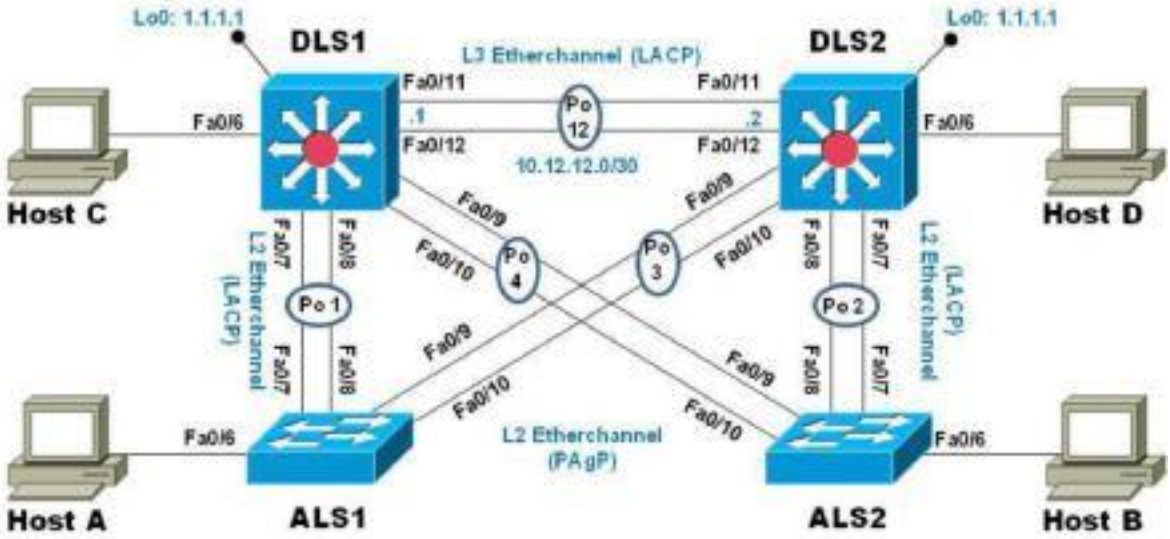
d. Verificar que las rutas filtradas no están presentes en las tablas de enrutamiento de los routers correctas.

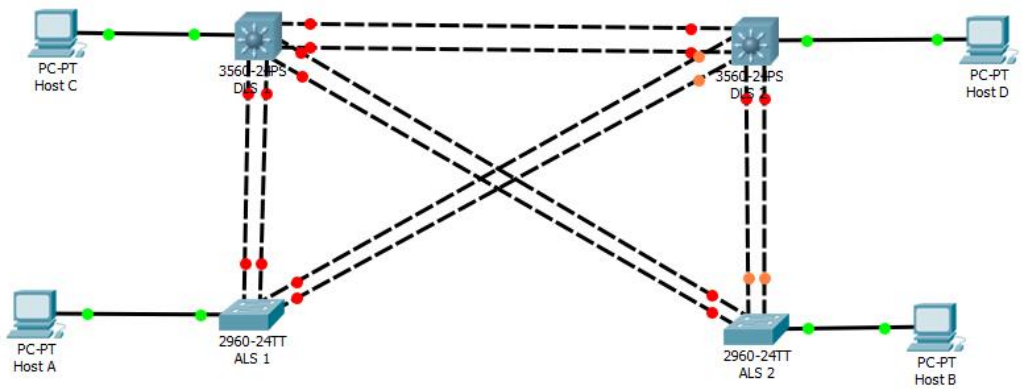
Nota: Puede ser que Una o más direcciones no serán accesibles desde todos los routers después de la configuración final debido a la utilización de listas de distribución para filtrar rutas y el uso de IPv4 e IPv6 en la misma red.

ESCENARIO 2 DE HABILIDADES PRÁCTICAS

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.

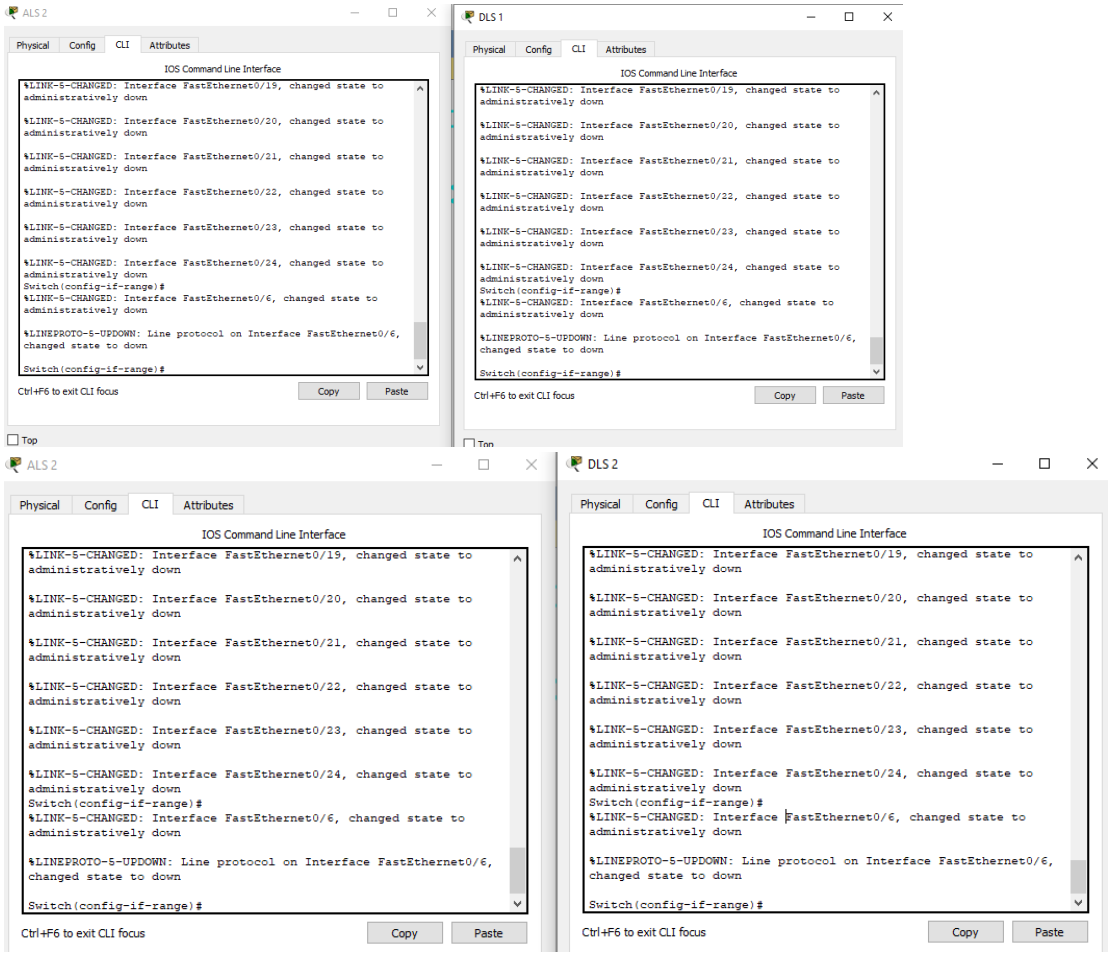
TOPOLOGÍA DE RED





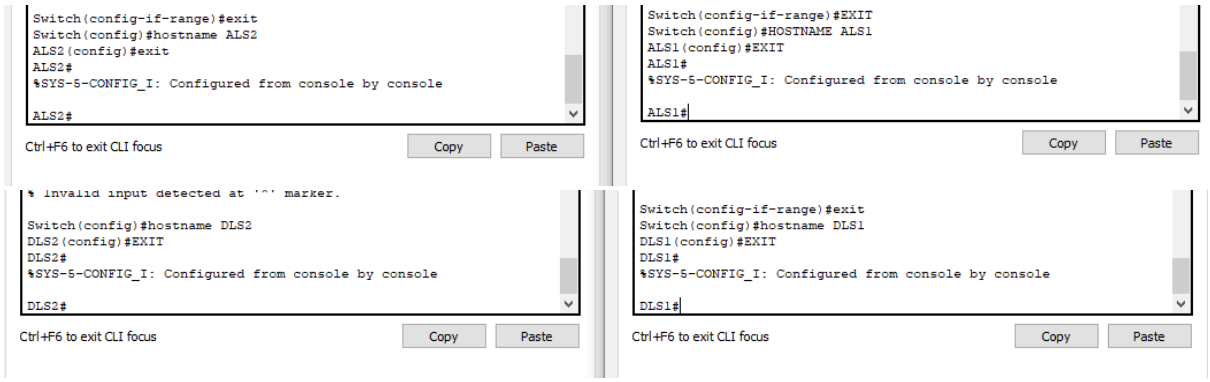
Parte 1: Configurar la red de acuerdo con las especificaciones.

a. Apagar todas las interfaces en cada switch.



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

```
Switch1>enable
Switch1#configure terminal
Switch1(config)#hostname DLS1
```



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.

```
DLS1>en
DLS1#conf ter
DLS1(config)#interface port-channel 12
DLS1(config-if)#no switchport
DLS1(config-if)#ip address 10.12.12.1 255.255.255.252
DLS1(config-if)#exit
DLS1(config)#interface range fa0/11-12
DLS1(config-if-range)#no switchport
DLS1(config-if-range)#channel-group 12 mode active
DLS1(config-if-range)#exit
DLS1(config)#exit
DLS2>en
DLS2#conf ter
DLS2(config)#interface port-channel 12
34
DLS2(config-if)#no switchport
DLS2(config-if)#ip address 10.12.12.2 255.255.255.252
DLS2(config-if)#exit
DLS2(config)#interface range fa0/11-12
DLS2(config-if-range)#no switchport
DLS2(config-if-range)#channel-group 12 mode active
```

DLS2(config-if-range)#exit

DLS 1

Physical Config CLI Attributes

```
DLS1(config-if)#no switchport
DLS1(config-if)#ip address 10.12.12.1 255.255.255.252
DLS1(config-if)#exit
DLS1(config)#interface range fa0/11-12
DLS1(config-if-range)#no switchport
DLS1(config-if-range)#channel-group 12 mode active
DLS1(config-if-range)#exit
DLS1(config)#exit
DLS1#
```

DLS 2

Physical Config CLI Attributes

IOS Command Line Interface

```
DLS2>en
DLS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#interface port-channel 12
DLS2(config-if)#no switchport
DLS2(config-if)#ip address 10.12.12.2 255.255.255.252
DLS2(config-if)#exit
DLS2(config)#interface range fa0/11-12
DLS2(config-if-range)#no switchport
DLS2(config-if-range)#channel-group 12 mode active
DLS2(config-if-range)#exit
DLS2(config)#
```

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

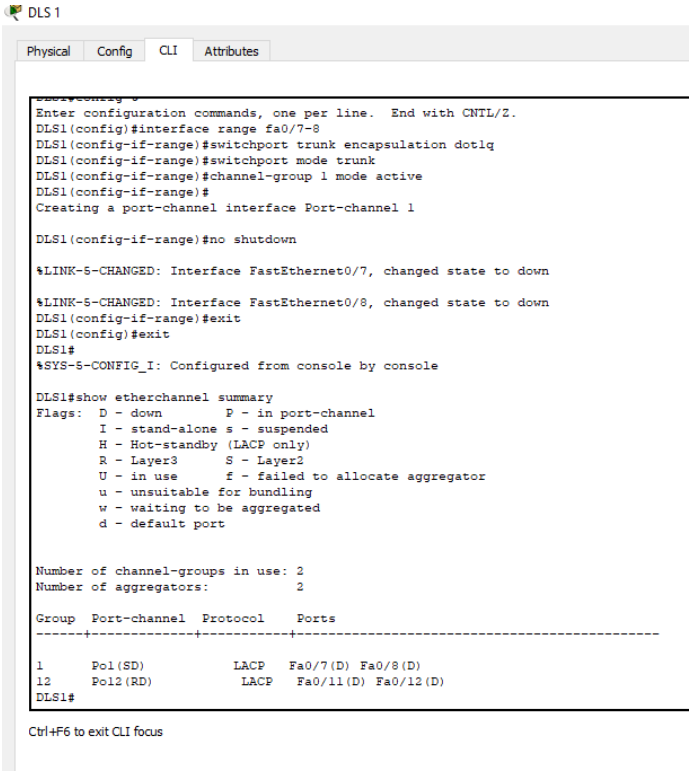
```
DLS2#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


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

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

12     Po12(RD)            LACP   Fa0/11(D) Fa0/12(D)
DLS2#
```

```
DLS1#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
------+-------------+-----------
+---------------------------------------------

12     Po12(RD)            LACP   Fa0/11(D) Fa0/12(D)
DLS1#
```

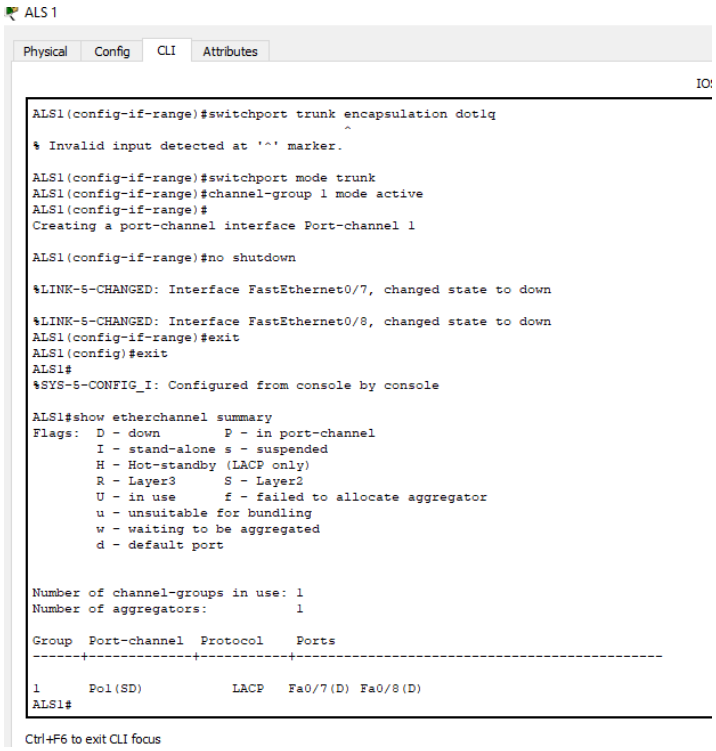
2) Los Port-channels en las interfaces Fa0/7 y Fa0/8 utilizarán LACP.

Para este utilizamos los siguientes comandos:

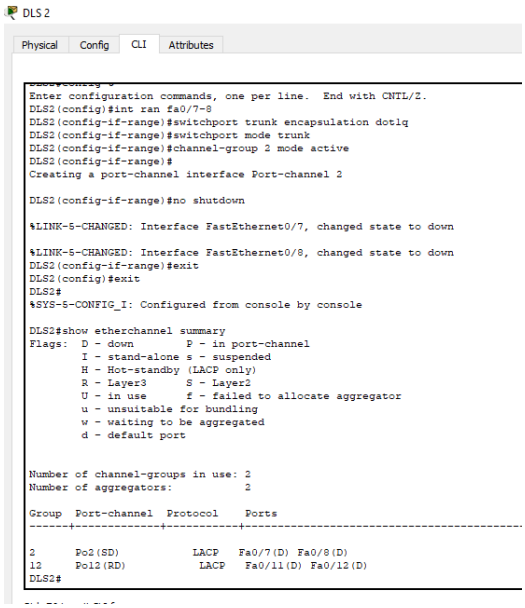
DLS1#en
DLS1#conf term
DLS1(config)#int ran fa0/7-8
DLS1(config-if-range)#switchport trunk encapsulation dot1q
DLS1(config-if-range)#switchport mode trunk
DLS1(config-if-range)#channel-group 1 mode active
DLS1(config-if-range)#no shutdown



ALS1(config)#int ran fa0/7-8
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



DLS2(config)#int ran fa0/7-8
DLS2(config-if-range)#switchport trunk encapsulation dot1q
DLS2(config-if-range)#switchport mode trunk
DLS2(config-if-range)#channel-group 2 mode active
DLS2(config-if-range)#no shutdown



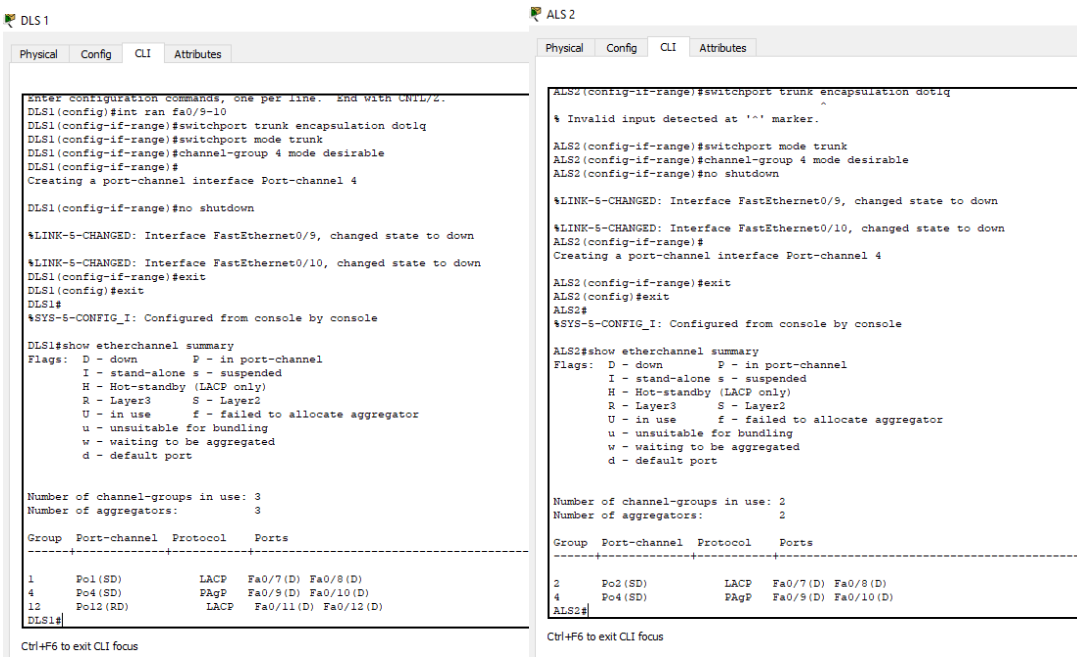
ALS2(config)#int ran fa0/7-8
ALS2(config-if-range)#switchport trunk encapsulation dot1q
ALS2(config-if-range)#switchport mode trunk
ALS2(config-if-range)#channel-group 2 mode active

ALS2(config-if-range)#no shutdown

3) Los Port-channels en las interfaces F0/9 y fa0/10 utilizará PAgP. Para este procedimiento utilizamos los siguientes comandos:

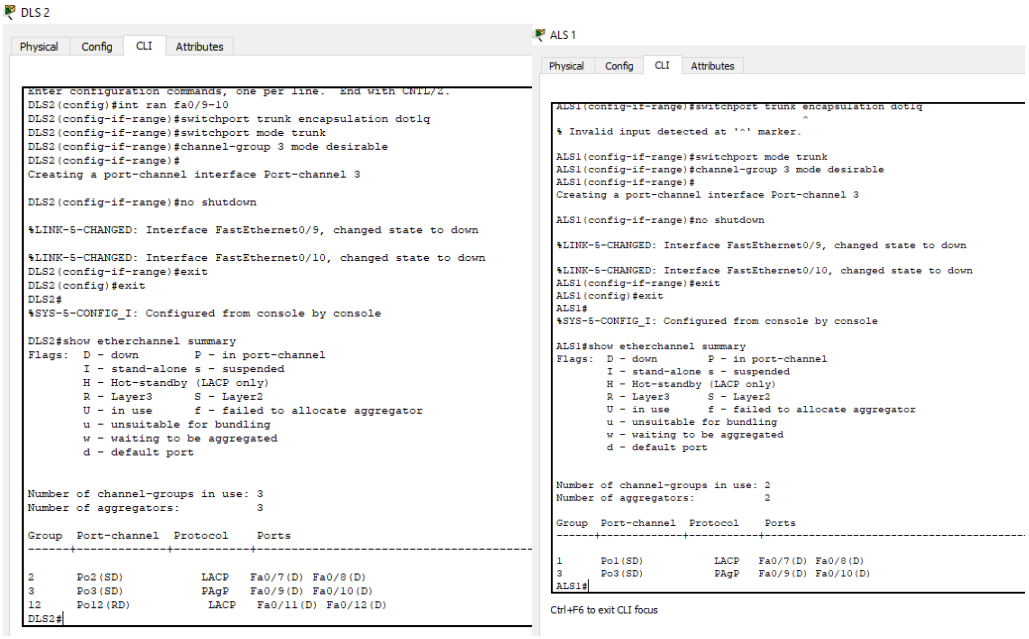
DLS1(config)#int ran fa0/9-10
DLS1(config-if-range)# switchport trunk encapsulation dot1q
DLS1(config-if-range)# switchport mode trunk
DLS1(config-if-range)#channel-group 4 mode desirable
Creating a port-channel interface Port-channel 4
DLS1(config-if-range)#no shutdown

ALS2(config)#int ran fa0/9-10
ALS2(config-if-range)# switchport trunk encapsulation dot1q
ALS2(config-if-range)# switchport mode trunk
ALS2(config-if-range)#channel-group 4 mode desirable
Creating a port-channel interface Port-channel 4
ALS2(config-if-range)#no shutdown



DLS2(config)#int ran fa0/9-10
DLS2(config-if-range)# switchport trunk encapsulation dot1q
DLS2(config-if-range)# switchport mode trunk
DLS2(config-if-range)#channel-group 3 mode desirable
Creating a port-channel interface Port-channel 3
DLS2(config-if-range)#no shutdown

ALS1(config)#int ran fa0/9-10
ALS1(config-if-range)# switchport trunk encapsulation dot1q
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)#no shutdown



int ran fa0/9-10
switchport trunk encapsulation dot1q
switchport mode trunk
channel-group 3 mode desirable
no shutdown

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

Para configurar y asignar a las vlan 800 tenemos:

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

```
DLS1#
DLS1#
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface Po1
DLS1(config-if)#switchport trunk native vlan 800
DLS1(config-if)#exit
DLS1(config)#interface Po4
DLS1(config-if)#switchport trunk native vlan 800
DLS1(config-if)#exit
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

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

```
DLS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS2(config)#interface Po2
DLS2(config-if)#switchport trunk native vlan 800
DLS2(config-if)#exit
DLS2(config)#interface Po3
DLS2(config-if)#switchport trunk native vlan 800
DLS2(config-if)#exit
DLS2(config)#
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

DLS2#
```

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 t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#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-if)#
ALS1(config-if)#exit
ALS1(config)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

ALS1#
```

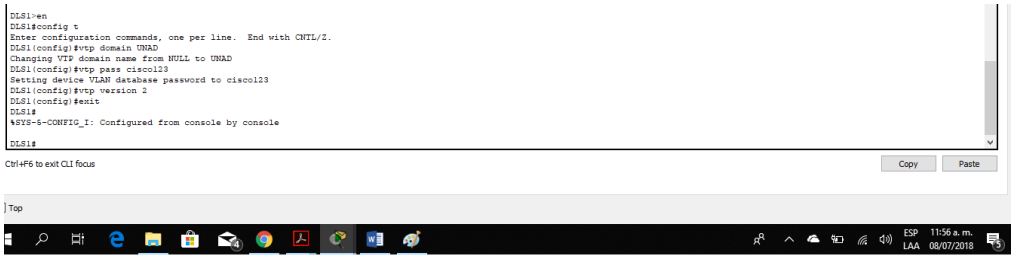
ALS2(config)#interface Po2
ALS2(config-if)#switchport trunk native vlan 800
ALS2(config-if)#interface Po4
ALS2 (config-if)#switchport trunk native vlan 800

```
ALS2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS2(config)#interface Po2
ALS2(config-if)#switchport trunk native vlan 800
ALS2(config-if)#exit
ALS2(config)#interface Po4
ALS2(config-if)#switchport trunk native vlan 800
ALS2(config-if)#exit
ALS2(config)#exit
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

ALS2#
```

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

1) Utilizar el nombre de dominio UNAD con la contraseña cisco123

DLS1(config)#vtp domain UNAD
Domain name already set to UNAD.
DLS1(config)#vtp pass cisco123
Setting device VLAN database password to cisco123
DLS1(config)#vtp version 2



ALS1(config)#vtp domain UNAD
Domain name already set to UNAD.
ALS1(config)#vtp pass cisco123
Setting device VLAN database password to cisco123
ALS1(config)#vtp version 2

```
ALS1>en
ALS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#vtp domain UNAD
Changing VTP domain name from NULL to UNAD
ALS1(config)#vtp pass cisco123
Setting device VLAN database password to cisco123
ALS1(config)#vtp version 2
ALS1(config)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

ALS1#
```

ALS2(config)#vtp domain UNAD
Changing VTP domain name from NULL to UNAD
ALS2(config)#vtp pass cisco123
Setting device VLAN database password to cisco123
ALS2(config)#vtp version 2

```
ALS2>en
ALS2#config t
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 cisco123
Setting device VLAN database password to cisco123
ALS2(config)#vtp version 2
ALS2(config)#exit
ALS2#
%SYS-5-CONFIG_I: Configured from console by console

ALS2#
```

2) Configurar DLS1 como servidor principal para las VLAN.

```
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#vtp mode server
Device mode already VTP SERVER.
DLS1(config)#
```

```
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                       : 0001.97DD.D130
Configuration last modified by 0.0.0.0 at 3-1-93 01:54:19
Local updater ID is 0.0.0.0 (no valid interface found)

Feature VLAN :
--------------
VTP Operating Mode                : Server
Maximum VLANs supported locally   : 1005
Number of existing VLANs          : 5
Configuration Revision            : 1
MD5 digest                        : 0x4A 0xB1 0x29 0x39 0x90 0x66 0x68 0x70
                                    0x68 0x00 0x4B 0x60 0x5E 0xD5 0x27 0x5E

DLS1#
```

3) Configurar ALS1 y ALS2 como clientes VTP.

ALS1(config)#vtp mode client

Setting device to VTP CLIENT mode

```
ALS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
ALS1(config)#vtp mode client
Setting device to VTP CLIENT mode.
ALS1(config)#exit
ALS1#
%SYS-5-CONFIG_I: Configured from console by console

ALS1#show vtp status
VTP Version                     : 2
Configuration Revision          : 1
Maximum VLANs supported locally : 255
Number of existing VLANs        : 5
VTP Operating Mode              : Client
VTP Domain Name                 : UNAD
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Enabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0x14 0xE2 0xEB 0x8F 0xE5 0x1B 0x35 0x52
Configuration last modified by 0.0.0.0 at 3-1-93 01:52:48
ALS1#
```

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

```
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
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
VLAN_CREATE_FAIL: Failed to create VLANs 1111 : extended VLAN(s) not allowed in current VTP mode
DLS1(config)#vlan 1112
VLAN_CREATE_FAIL: Failed to create VLANs 1112 : extended VLAN(s) not allowed in current VTP mode
DLS1(config)#vlan 11
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
VLAN_CREATE_FAIL: Failed to create VLANs 1010 : extended VLAN(s) not allowed in current VTP mode
DLS1(config)#vlan 10
DLS1(config-vlan)#name VOZ
DLS1(config-vlan)#vlan 3456
VLAN_CREATE_FAIL: Failed to create VLANs 3456 : extended VLAN(s) not allowed in current VTP mode
DLS1(config)#vlan 34
DLS1(config-vlan)#name ADMINISTRACION
DLS1(config-vlan)#
```

```
DLS1#show vlan

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

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

f. En DLS1, suspender la VLAN 434.

```
DLS1(config)#vlan 434
DLS1(config-vlan)#suspend
                   ^
% Invalid input detected at '^' marker.

DLS1(config-vlan)#state suspend
                   ^
% Invalid input detected at '^' marker.

DLS1(config-vlan)#
```

Para esta versión no es posible ejecutar el comando para suspender la VLAN, si es posible eliminarla, pero para efectos la dejare habilitada.

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

```
DLS2(config)#vtp mode transparent
Setting device to VTP TRANSPARENT mode.
DLS2(config)#exit
DLS2#
%SYS-5-CONFIG_I: Configured from console by console
```

DLS 2

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
DLS2#
%SYS-5-CONFIG_I: Configured from console by console

DLS2#config t
Enter configuration commands, one per line.  End with CN
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)#name HUESPEDES
DLS2(config-vlan)#vlan 123
DLS2(config-vlan)#name MANTENIMIENTO
DLS2(config-vlan)#vlan 1111
DLS2(config-vlan)#VIDEONET
                   ^
% Invalid input detected at '^' marker.

DLS2(config-vlan)#name VIDEONET
DLS2(config-vlan)#vlan 1010
DLS2(config-vlan)#nam VOZ
DLS2(config-vlan)#vlan 3456
DLS2(config-vlan)#name ADMINISTRACION
DLS2(config-vlan)#exit
DLS2(config)#
```

Ctrl+F6 to exit CLI focus Copy

h. Suspender VLAN 434 en DLS2.

DLS2(config)#vlan 434
DLS2(config-vlan)# state suspend
DLS2(config)#

Para esta versión no es posible ejecutar el comando para suspender la VLAN, si es posible eliminarla, pero para efectos la dejare habilitada.

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.

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

Ctrl+F6 to exit CLI focus Copy Paste

```
DLS2(config)#vlan 567
DLS2(config-vlan)#name CONTABILIDAD
DLS2(config-vlan)#EXIT
```

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.

```
DLS1(config)#spanning-tree vlan 1,12,434,800,101,111,345 root
primary
DLS1(config)#spanning-tree vlan 123,234 root secondary
DLS1(config)#
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#
```

Ctrl+F6 to exit CLI focus Copy Paste

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.

```
DLS2(config)#spanning-tree vlan 123,234 root primary
DLS2(config)#spanning-tree vlan 1,12,434,800,101,111,345 root
secondary
DLS2(config)#
```

Ctrl+F6 to exit CLI focus Copy Paste

I. 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

Physical | Config | CLI | Attributes

IOS Comm

```
interface Port-channel1
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface Port-channel4
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface Port-channel12
 no switchport
 ip address 10.12.12.1 255.255.255.252
```

DLS2

Physical | Config | CLI | Attributes

IOS Command Line Inte

```
!
interface Port-channel2
 switchport trunk native vlan 800
 switchport trunk allowed vlan 1-566,568-1005
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface Port-channel3
 switchport trunk native vlan 800
 switchport trunk allowed vlan 1-566,568-1005
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface Port-channel12
 no switchport
 ip address 10.12.12.2 255.255.255.252
!
interface FastEthernet0/7
 switchport trunk native vlan 800
 switchport trunk allowed vlan 1-566,568-1005
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 2 mode active
!
interface FastEthernet0/8
 switchport trunk native vlan 800
 switchport trunk allowed vlan 1-566,568-1005
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 2 mode active
!
interface FastEthernet0/9
 switchport trunk native vlan 800
 switchport trunk allowed vlan 1-566,568-1005
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 3 mode desirable
!
interface FastEthernet0/10
 switchport trunk native vlan 800
 switchport trunk allowed vlan 1-566,568-1005
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 3 mode desirable
!
```

```
interface FastEthernet0/7
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/8
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/9
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 4 mode desirable
!
interface FastEthernet0/10
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 4 mode desirable
```

ALS1

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
!
interface Port-channel1
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface Port-channel3
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
```

```
!
interface FastEthernet0/7
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/8
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 1 mode active
!
interface FastEthernet0/9
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 3 mode desirable
!
interface FastEthernet0/10
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 3 mode desirable
!
```

ALS2

Physical | Config | CLI | Attributes

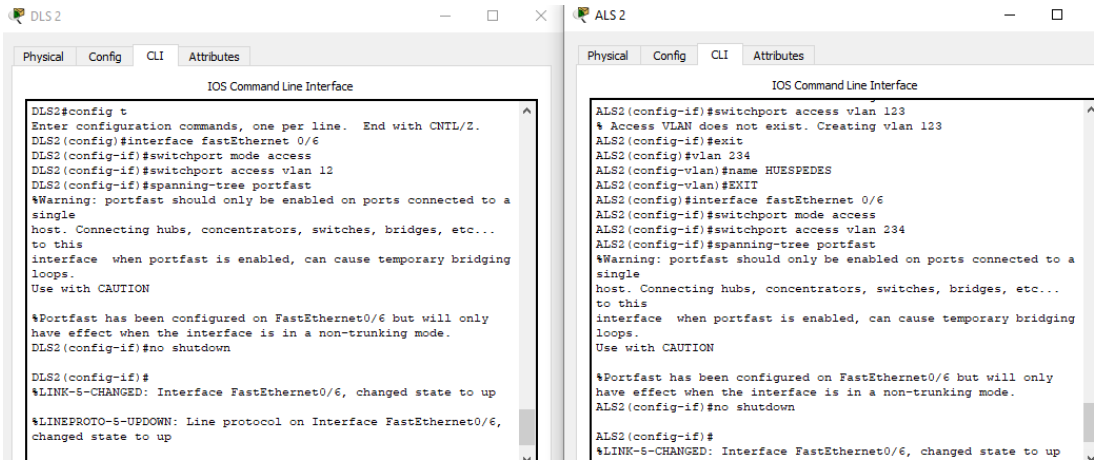
IOS Command Line Interface

```
!
interface Port-channel2
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface Port-channel4
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
!
interface FastEthernet0/7
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 2 mode active
!
interface FastEthernet0/8
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 2 mode active
!
interface FastEthernet0/9
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 4 mode desirable
!
interface FastEthernet0/10
 switchport trunk native vlan 800
 switchport trunk encapsulation dot1q
 switchport mode trunk
 channel-group 4 mode desirable
!
```

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		

DLS1(config-if)#switchport access vlan 345
DLS1(config-if)#spanning-tree portfast
DLS1(config-if)#no shutdown



n. Todas las interfaces que no sean utilizadas o asignadas a alguna VLAN deberán ser apagadas.

```
DLS1>en
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#int ran f0/1-5, f0/13-14, f0/19-24, g0/1-2
DLS1(config-if-range)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to down

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

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

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

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

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

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

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

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

%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to down
DLS1(config-if-range)#
```

o. Configurar SVI en DLS1 y DLS2 como soporte de todas las VLAN y de enrutamiento entre las VLAN. Utilice la siguiente tabla para las asignaciones de subred:

VLAN	Nombre de VLAN	subred	VLAN	Nombre de VLAN	subred
12	EJECUTIVOS	10.0.12.0/24	123	MANTENIMIENTO	10.0.123.0/24
234	HUESPEDES	10.0.234.0/24	1010	VOZ	10.10.10.0/24
1111	VIDEONET	10.11.11.0/24	3456	ADMINISTRACIÓN	10.34.56.0/24

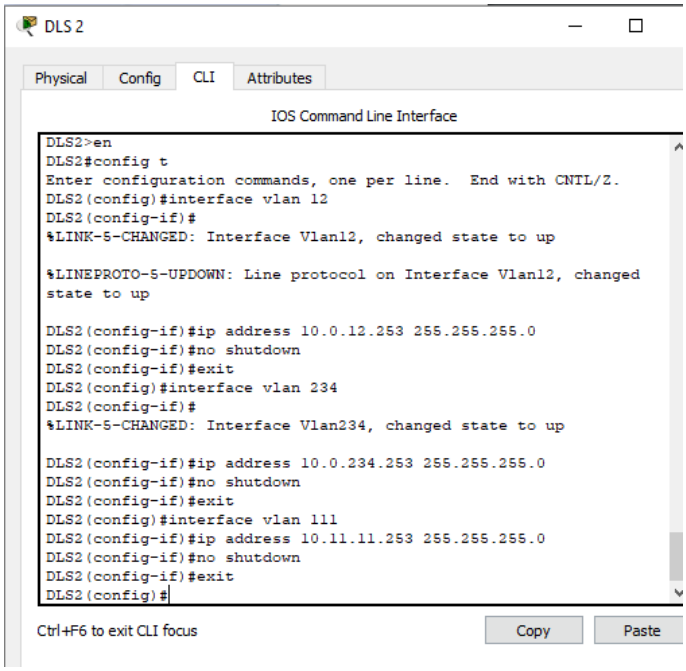
- DLS1 siempre utilizará la dirección .252 y DLS2 siempre utilizará la dirección

  .253 para las direcciones IPv4.

Utilizamos los siguientes comandos tanto para DLS1, DLS2.

DLS1(config)#interface vlan 12
DLS1(config-if)#ip address 10.0.12.252 255.255.255.0
DLS1(config-if)#no shutdown

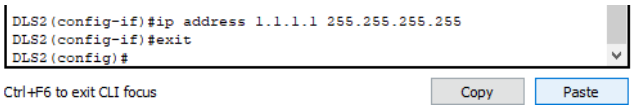
```
DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface vlan 12
DLS1(config-if)#
%LINK-5-CHANGED: Interface Vlan12, changed state to up
ip address 10.0.12.252 255.255.255.0
DLS1(config-if)#ip address 10.0.12.252 255.255.255.0
DLS1(config-if)#no shutdown
DLS1(config-if)#exit
DLS1(config)#interface vlan 234
DLS1(config-if)#
%LINK-5-CHANGED: Interface Vlan234, changed state to up

DLS1(config-if)#ip address 10.0.234
DLS1#
%SYS-5-CONFIG_I: Configured from console by console

DLS1#interface vlan 12
                ^
% Invalid input detected at '^' marker.

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

DLS1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
DLS1(config)#interface vlan 234
DLS1(config-if)#ip address 10.0.234.252 255.255.255.0
DLS1(config-if)#no shutdown
DLS1(config-if)#exit
DLS1(config)#interface vlan 111
DLS1(config-if)#ip address 10.11.11.252 255.255.255.0
DLS1(config-if)#no shutdown
DLS1(config-if)#exit
DLS1(config)#exit
DLS1#
%SYS-5-CONFIG_I: Configured from console by console
```

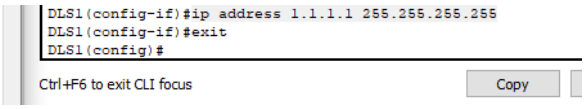


DLS2(config)#interface vlan 12
DLS2(config-if)#ip address 10.0.12.253 255.255.255.0
DLS2(config-if)#no shutdown

La VLAN 567 en DLS2 no podrá ser soportada para enrutamiento.

o. **Configurar una interfaz Loopback 0 en DLS1 y DLS2. Esta interfaz será configurada con la dirección IP 1.1.1.1/32 en ambos Switch**.
INGRESAMOS LOS SIGUIENTES COMANDOS:
DLS1#conf terminal
DLS1(config)#interface loopback 0
DLS1(config-if)#ip address 1.1.1.1 255.255.255.255





p. Configurar HSRP con interfaz tracking para las VLAN 12, 123, 234, 1010, y 1111

1) Utilizar HSRP versión 2

2) Crear dos grupos HSRP, alineando VLAN 12, 1010, 1111, y 3456 para el primer grupo y las VLAN 123 y 234 para el segundo grupo.

3) DLS1 será el Switch principal de las VLAN 12, 1010, 1111, y 3456 y DLS2 será el Switch principal para las VLAN 123 y 234.

4) Utilizar la dirección virtual .254 como la dirección de Standby de todas las VLAN

Utilizamos la siguiente secuencia de comandos para el cumplimiento de lo estipulado.
DLS1(config)#interface Vlan 12
DLS1(config-if)#standby 1 ip 10.0.12.254
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 101

```
DLS1(config-if)#standby 1 ip 10.10.10.254
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 111
DLS1(config-if)#standby 1 ip 10.11.11.254
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 345
DLS1(config-if)#standby 1 ip 10.34.56.254
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 123
DLS1(config-if)#standby 2 ip 10.0.123.254
DLS1(config-if)#standby 2 priority 100
DLS1(config-if)#standby 2 preempt
DLS1(config-if)#standby 2 track FastEthernet0/11
DLS1(config-if)#standby 2 track FastEthernet0/12
DLS1(config-if)#interface Vlan 234
DLS1(config-if)#standby 2 ip 10.0.234.254
DLS1(config-if)#standby 2 priority 100
DLS1(config-if)#standby 2 preempt
DLS1(config-if)#standby 2 track FastEthernet0/11
DLS1(config-if)#standby 2 track FastEthernet0/12
```

```
DLS1(config-if)#
DLS1(config-if)#ip address 1.1.1.1 255.255.255.255
DLS1(config-if)#exit
DLS1(config)#
DLS1(config)#interface Vlan 12
DLS1(config-if)#standby 1 ip 10.0.12.254
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 101
DLS1(config-if)#standby 1 ip 10.10.10.254
% Warning: address is not within a subnet on this interface
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 111
DLS1(config-if)#standby 1 ip 10.11.11.254
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 345
DLS1(config-if)#standby 1 ip 10.34.56.254
% Warning: address is not within a subnet on this interface
DLS1(config-if)#standby 1 priority 200
DLS1(config-if)#standby 1 preempt
DLS1(config-if)#standby 1 track FastEthernet0/11
DLS1(config-if)#standby 1 track FastEthernet0/12
DLS1(config-if)#interface Vlan 123
DLS1(config-if)#standby 2 ip 10.0.123.254
% Warning: address is not within a subnet on this interface
DLS1(config-if)#standby 2 priority 100
DLS1(config-if)#standby 2 preempt
DLS1(config-if)#standby 2 track FastEthernet0/11
DLS1(config-if)#standby 2 track FastEthernet0/12
DLS1(config-if)#interface Vlan 234
```

Ctrl+F6 to exit CLI focus

Con el comando Show Standby podemos verificar que las vlan correspondientes hayan quedado Active y las demás Standby.

DLS1#Show Standby
Vlan12 - Group 1
State is Init (interface down)
Virtual IP address is 10.0.12.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 180 (configured 200)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-1 (default)
Vlan234 - Group 2
State is Init (interface down)
Virtual IP address is 10.0.234.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC02 (v1 default)

Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 80 (default 100)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl2-2 (default)
Vlan111 - Group 1
State is Init (interface down)
Virtual IP address is 10.11.11.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 180 (configured 200)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-1 (default)
Vlan101 - Group 1
State is Init (interface down)
Virtual IP address is 10.10.10.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 180 (configured 200)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-1 (default)
Vlan345 - Group 1
State is Init (interface down)
Virtual IP address is 10.34.56.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)

Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 180 (configured 200)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl3-1 (default)
Vlan123 - Group 2
State is Init (interface down)
Virtual IP address is 10.0.123.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC02 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 80 (default 100)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-2 (default)

Se relaciona a continuación el resultado del comando en el Switch DLS2:

DLS2(config)#interface Vlan 12
DLS2(config-if)#standby 1 ip 10.0.12.254
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 101
DLS2(config-if)#standby 1 ip 10.10.10.254
58
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 111
DLS2(config-if)#standby 1 ip 10.11.11.254
DLS2(config-if)#standby 1 priority 100

DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 345
DLS2(config-if)#standby 1 ip 10.34.56.254
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 123
DLS2(config-if)#standby 2 ip 10.0.123.254
DLS2(config-if)#standby 2 priority 200
DLS2(config-if)#standby 2 preempt
DLS2(config-if)#standby 2 track FastEthernet0/11
DLS2(config-if)#standby 2 track FastEthernet0/12
DLS2(config-if)#interface Vlan 234
DLS2(config-if)#standby 2 ip 10.0.234.254
DLS2(config-if)#standby 2 priority 200
DLS2(config-if)#standby 2 preempt
DLS2(config-if)#standby 2 track FastEthernet0/11
DLS2(config-if)#standby 2 track FastEthernet0/12

```
DLS2(config)#interface Vlan 12
DLS2(config-if)#standby 1 ip 10.0.12.254
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 101
DLS2(config-if)#standby 1 ip 10.10.10.254
% Warning: address is not within a subnet on this interface
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 111
DLS2(config-if)#standby 1 ip 10.11.11.254
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 345
DLS2(config-if)#standby 1 ip 10.34.56.254
% Warning: address is not within a subnet on this interface
DLS2(config-if)#standby 1 priority 100
DLS2(config-if)#standby 1 preempt
DLS2(config-if)#standby 1 track FastEthernet0/11
DLS2(config-if)#standby 1 track FastEthernet0/12
DLS2(config-if)#interface Vlan 123
DLS2(config-if)#standby 2 ip 10.0.123.254
% Warning: address is not within a subnet on this interface
DLS2(config-if)#standby 2 priority 200
DLS2(config-if)#standby 2 preempt
DLS2(config-if)#standby 2 track FastEthernet0/11
DLS2(config-if)#standby 2 track FastEthernet0/12
DLS2(config-if)#interface Vlan 234
DLS2(config-if)#standby 2 ip 10.0.234.254
DLS2(config-if)#standby 2 priority 200
DLS2(config-if)#standby 2 preempt
DLS2(config-if)#standby 2 track FastEthernet0/11
```

DLS2#Show Standby
Vlan12 - Group 1
State is Active
8 state changes, last state change 04:52:30
Virtual IP address is 10.0.12.254

Active virtual MAC address is 0000.0C07.AC01
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.816 secs
Preemption enabled
Active router is local
Standby router is unknown
Priority 80 (default 100)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-1 (default)
Vlan234 - Group 2
State is Init (interface down)
Virtual IP address is 10.0.234.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC02 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 180 (configured 200)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl2-2 (default)
Vlan111 - Group 1
State is Init (interface down)
Virtual IP address is 10.11.11.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 80 (default 100)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-1 (default)
Vlan101 - Group 1
State is Init (interface down)
Virtual IP address is 10.10.10.254

Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 80 (default 100)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-1 (default)
Vlan345 - Group 1
State is Init (interface down)
Virtual IP address is 10.34.56.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC01 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 80 (default 100)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl3-1 (default)
Vlan123 - Group 2
State is Init (interface down)
Virtual IP address is 10.0.123.254
Active virtual MAC address is unknown
Local virtual MAC address is 0000.0C07.AC02 (v1 default)
Hello time 3 sec, hold time 10 sec
Next hello sent in 1.180 secs
Preemption enabled
Active router is unknown
Standby router is unknown
Priority 180 (configured 200)
Track interface FastEthernet0/11 state Down decrement 10
Track interface FastEthernet0/12 state Down decrement 10
Group name is hsrp-Vl1-2 (default)

r. **Configurar DLS1 como un servidor DHCP para las VLAN 12, 123 y 234**

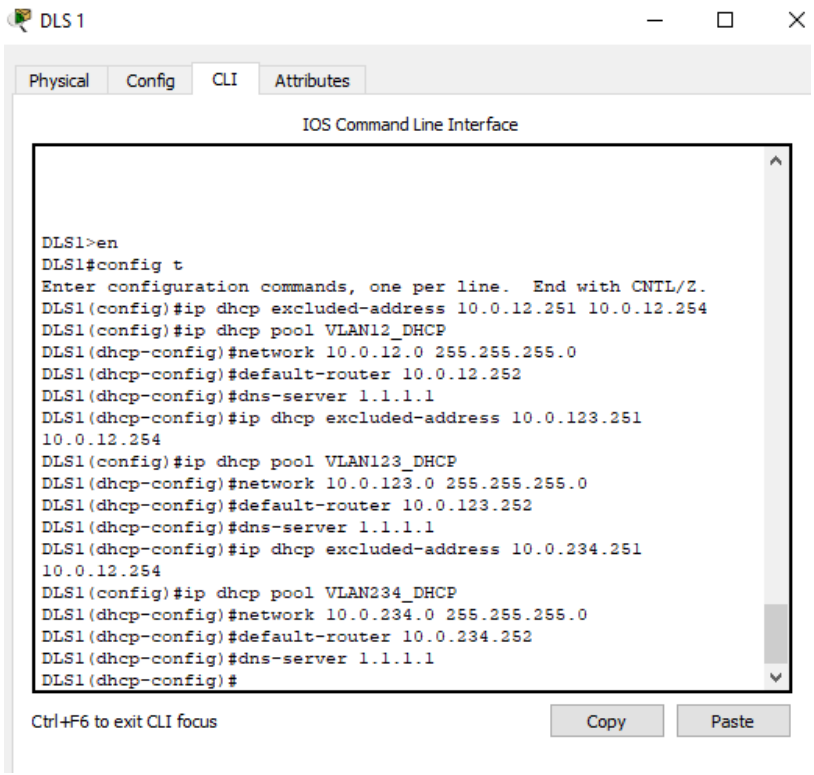
1) Excluir las direcciones desde .251 hasta .254 en cada subred

2) Establecer el servidor DNS a 1.1.1.1 para los tres Pool.

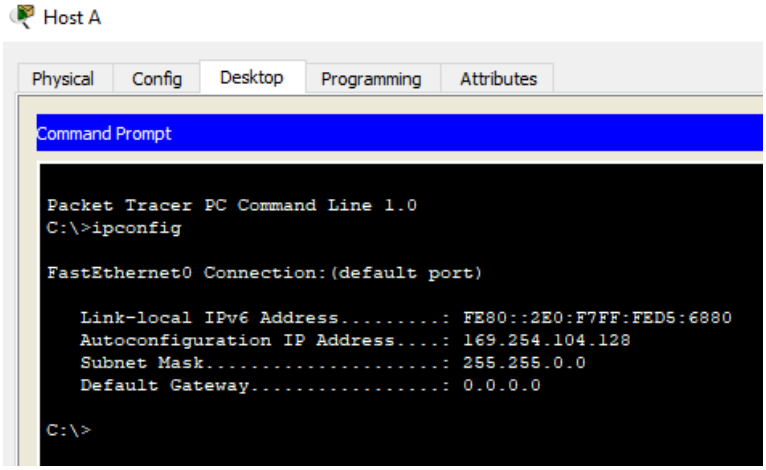
3) Establecer como default-router las direcciones virtuales HSRP para cada VLAN.

De acuerdo a lo solicitado aplicamos la siguiente secuencia de comandos.

```
DLS1(config)#ip dhcp excluded-address 10.0.12.251 10.0.12.254
DLS1(config)#ip dhcp pool VLAN12_DHCP
DLS1(dhcp-config)#network 10.0.12.0 255.255.255.0
61
DLS1(dhcp-config)#default-router 10.0.12.252
DLS1(dhcp-config)#dns-server 1.1.1.1
DLS1(dhcp-config)#ip dhcp excluded-address 10.0.123.251 10.0.12.254
DLS1(config)#ip dhcp pool VLAN123_DHCP
DLS1(dhcp-config)#network 10.0.123.0 255.255.255.0
DLS1(dhcp-config)#default-router 10.0.123.252
DLS1(dhcp-config)#dns-server 1.1.1.1
DLS1(dhcp-config)#ip dhcp excluded-address 10.0.234.251 10.0.12.254
DLS1(config)#ip dhcp pool VLAN234_DHCP
DLS1(dhcp-config)#network 10.0.234.0 255.255.255.0
DLS1(dhcp-config)#default-router 10.0.234.252
DLS1(dhcp-config)#dns-server 1.1.1.1
```



q. Obtener direcciones IPv4 en los host A, B, y D a través de la configuración por DHCP que fue realizada.



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

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

```
DLS1#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
                                                Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24, Gig0/1, Gig0/2
10   VOZ                              active
11   VIDEONET                         active
12   EJECUTIVOS                       active
34   ADMINISTRACION                   active    Fa0/6
123  MANTENIMIENTO                    active
234  HUESPEDES                        active
345  VLAN0345                         active
434  ESTACIONAMIENTO                  active
800  NATIVA                           active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
 --More--
```

```
VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Po2, Po3, 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
                                                 Fa0/15, 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    Fa0/6
123  MANTENIMIENTO                     active
234  HUESPEDES                         active
567  CONTABILIDAD                      active
800  NATIVA                            active
1002 fddi-default                      act/unsup
1003 token-ring-default                act/unsup
1004 fddinet-default                   act/unsup
1005 trnet-default                     act/unsup
1010 VOZ                               active
1111 VIDEONET                          active
3456 ADMINISTRACION                    active

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
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
```

DLS 1

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
FastEthernet0/8 (1), with ALS1 FastEthernet0/7 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/7 (1), with ALS1 FastEthernet0/7 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/8 (1), with ALS1 FastEthernet0/8 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/7 (1), with ALS1 FastEthernet0/8 (800).
ce trunk
Port        Mode         Encapsulation  Status        Native vlan
Po4         on           802.1q         trunking      800

Port        Vlans allowed on trunk
Po4         1-1005

Port        Vlans allowed and active in management domain
Po4         1,10,11,12,34,123,234,345,434,800

Port        Vlans in spanning tree forwarding state and not
pruned
Po4         1,10,11,12,34,123,234,345,434,800

DLS1#
```

Ctrl+F6 to exit CLI focus

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```
ALS2#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Po2, Po4, 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, Fa0/15
                                                 Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                                 Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                                 Fa0/24, Gig0/1, Gig0/2
123  VLAN0123                          active
234  HUESPEDES                         active    Fa0/6
1002 fddi-default                      act/unsup
1003 token-ring-default                act/unsup
1004 fddinet-default                   act/unsup
1005 trnet-default                     act/unsup

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
123  enet  100123     1500  -      -      -        -    -        0      0
234  enet  100234     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#
ALS2#
```

DLS 2

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
FastEthernet0/8 (1), with ALS2 FastEthernet0/7 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/7 (1), with ALS2 FastEthernet0/8 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
FastEthernet0/8 (1), with ALS2 FastEthernet0/8 (800).


DLS2>en
DLS2#show interface trunk
Port        Mode         Encapsulation  Status        Native vlan
Po3         on           802.1q         trunking      800

Port        Vlans allowed on trunk
Po3         1-566,568-1005

Port        Vlans allowed and active in management domain
Po3         1,12,123,234,800

Port        Vlans in spanning tree forwarding state and not
pruned
Po3         12,123,234,800

DLS2#
```

Ctrl+F6 to exit CLI focus

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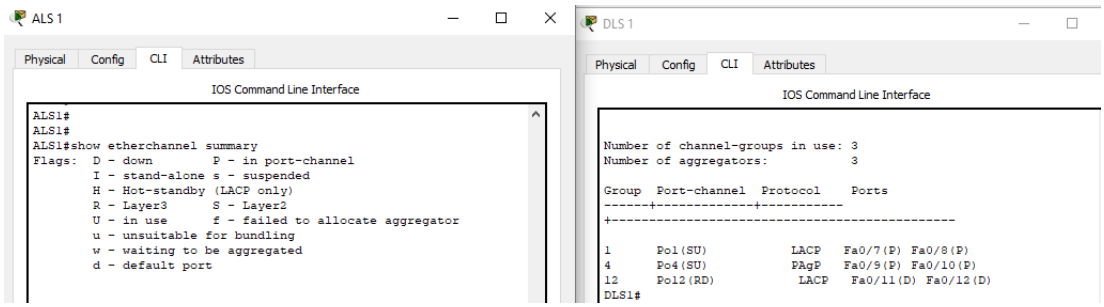
```
ALS1#show interface trunk
Port        Mode         Encapsulation  Status        Native vlan
Po3         on           802.1q         trunking      800

Port        Vlans allowed on trunk
Po3         1-1005

Port        Vlans allowed and active in management domain
Po3         1,10,11,12,34,123,234,345,434,800

Port        Vlans in spanning tree forwarding state and not pruned
Po3         1,10,11,12,34,123,234,345,434,800

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, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
10   VOZ                              active
11   VIDEONET                         active
12   EJECUTIVOS                       active
34   ADMINISTRACION                   active
123  MANTENIMIENTO                    active    Fa0/6
234  HUESPEDES                        active
345  VLAN0345                         active
434  ESTACIONAMIENTO                  active
800  NATIVA                           active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
 --More--
```

```
ALS2>en
ALS2#show interface trunk
Port        Mode         Encapsulation  Status        Native vlan
Po4         on           802.1q         trunking      800

Port        Vlans allowed on trunk
Po4         1-1005

Port        Vlans allowed and active in management domain
Po4         1,10,11,12,34,123,234,345,434,800

Port        Vlans in spanning tree forwarding state and not pruned
Po4         1,10,11,12,34,123,234,345,434,800

ALS2#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Po2, Fa0/1, Fa0/2, Fa0/3
                                                Fa0/4, Fa0/5, Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/1, Gig0/2
10   VOZ                              active
11   VIDEONET                         active
12   EJECUTIVOS                       active
34   ADMINISTRACION                   active
123  MANTENIMIENTO                    active
234  HUESPEDES                        active    Fa0/6
345  VLAN0345                         active
434  ESTACIONAMIENTO                  active
800  NATIVA                           active
1002 fddi-default                     act/unsup
1003 token-ring-default               act/unsup
1004 fddinet-default                  act/unsup
1005 trnet-default                    act/unsup
 --More--
```

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



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

```
DLS1#sh spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    24577
             Address     0030.F242.A864
             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     0030.F242.A864
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po1              Desg FWD 9         128.28   Shr
Po4              Desg FWD 9         128.29   Shr

VLAN0010
  Spanning tree enabled protocol ieee
  Root ID    Priority    32778
             Address     0001.C783.319C
             Cost        9
             Port        29(Port-channel4)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
             Address     0030.F242.A864
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po4              Root FWD 9         128.29   Shr

VLAN0011
  Spanning tree enabled protocol ieee
  Root ID    Priority    32779
             Address     0001.C783.319C
```

DLS 2

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
DLS2#sh Spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    24577
             Address     0030.F242.A864
             Cost        18
             Port        28(Port-channel2)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    28673  (priority 28672 sys-id-ext 1)
             Address     0005.5E97.8A84
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po2              Root FWD 9         128.28   Shr
Po3              Altn BLK 9         128.29   Shr

VLAN0012
  Spanning tree enabled protocol ieee
  Root ID    Priority    28684
             Address     0005.5E97.8A84
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    28684  (priority 28672 sys-id-ext 12)
             Address     0005.5E97.8A84
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

 --More--
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with ALS2 FastEthernet0/7 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/8 (1), with ALS2 FastEthernet0/7 (800).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/7 (1), with ALS2 FastEthernet0/8 (800).
```

ALS 1

Physical | Config | CLI | Attributes

```
ALS1>en
ALS1#sh Spanning-tree
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    24577
             Address     0030.F242.A864
             Cost        9
             Port        27(Port-channel1)
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769  (priority 32768 sys-id-ext 1)
             Address     0006.2AEA.78E7
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po1              Root FWD 9         128.27   Shr
Po3              Desg FWD 9         128.28   Shr

VLAN0010
  Spanning tree enabled protocol ieee
  Root ID    Priority    32778
             Address     0006.2AEA.78E7
             This bridge is the root
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32778  (priority 32768 sys-id-ext 10)
             Address     0006.2AEA.78E7
             Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po3              Desg FWD 9         128.28   Shr

VLAN0011
 --More--
```

Ctrl+F6 to exit CLI focus

ALS 2

Physical | Config | CLI | Attributes

```
VLAN0001
  Spanning tree enabled protocol ieee
  Root ID     Priority    24577
              Address     0030.F242.A864
              Cost        9
              Port        28(Port-channel4)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32769  (priority 32768 sys-id-ext 1)
              Address     0001.C783.319C
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Po2              Desg FWD 9         128.27   Shr
Po4              Root FWD 9         128.28   Shr

VLAN0010
  Spanning tree enabled protocol ieee
  Root ID     Priority    32778
              Address     0001.C783.319C
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32778  (priority 32768 sys-id-ext 10)
              Address     0001.C783.319C
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/8            Desg FWD 19        128.8    P2p
Fa0/7            Desg FWD 19        128.7    P2p
Fa0/9            Desg FWD 19        128.9    P2p
Po4              Desg FWD 9         128.28   Shr

VLAN0011
 --More--
```

Ctrl+F6 to exit CLI focus

CONCLUSIONES

- Las configuraciones básicas en los dispositivos de comunicación cisco permiten al estudiante bases para la configuraciones de redes locales y llevarlas a topologías más grandes.
- Es de gran importancia las claves en los dispositivos controladores de redes ya que de esta depende que no pueda ser filtrado y de esta manera roben la información.
- La encriptación de la información es de suma importancia ya que si la red es filtrada la información mostrara caracteres no descifrables.
- **EIGRP** es un protocolo de encaminamiento vector distancia avanzado, propiedad de Cisco Systems, que ofrece lo mejor de los algoritmos de vector de distancias y del estado de enlace. Se considera un protocolo avanzado que se basa en las características normalmente asociadas con los protocolos del estado de enlace. Algunas de las mejores funciones de OSPF, como las actualizaciones parciales y la detección de vecinos, se usan de forma similar con EIGRP. Aunque no garantiza el uso de la mejor ruta, es bastante usado porque EIGRP es algo más fácil de configurar que OSPF. EIGRP mejora las propiedades de convergencia y opera con mayor eficiencia que IGRP. Esto permite que una red tenga una arquitectura mejorada y pueda mantener las inversiones actuales en IGRP.
- El área a través de la cual configura el enlace virtual OSPF, se denomina área de tránsito, debe tener información completa de enrutamiento y no fue ser un área stub.
- Sin duda que OSPF es un protocolo complejo y requiere mucho estudio para poder comprender bien cómo funciona, y mucha práctica para poder dominarlo. Uno de los conceptos más importantes dentro de OSPF es el diseño y funcionamiento de las distintas áreas, cosa que confunde bastante cuando se está conociendo este protocolo.
- En NAT existen tipos de funcionamiento, tales como estática, dinámica, sobrecarga y solapamiento. NAT Habilita las redes de IP privado que utilizan los IP Address no registrados para conectar con el Internet.

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