DIPLOMADO DE PROFUNDIZACION CISCO
PRUEBA DE HABILIDADES PRÁCTICAS CCNP

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DIPLOMADO DE OPCIÓN DE GRADO PARA OPTAR EL TÍTULO DE INGENIERO EN TELECOMUNICACIONES

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CONTENIDO

LISTA DE TABLAS

LISTA DE FIGURAS

GLOSARIO

Autenticación: Protocolo que impide que usuarios no autorizados ingresen a la red, para ello se configura los dispositivos para que solicite id y credenciales predeterminadas para cada usuario.

Convergencia de red: Integración de todos los servicios: voz, datos y videos dentro de una red integral, aunque los dispositivos sean distintos.

Enrutamiento: Protocolo para permitir el tráfico de datos(paquetes) entre dispositivos de distintas redes.

Ip: Protocolo de internet estandarizado para el tráfico de datos.

Jerarquía de red: Segmento en capas donde cada una de ellas tiene funciones específicas y se determina dentro de la red general.

Red LAN: (Local área network): Estructura de red con dispositivos cercanos donde sus usuarios comparten recursos.

Red WAN: (Wid área network): Cumple las mismas funciones de una red Lan pero en una zona geográfica más amplia.

Roaming: Permite que se pueda usar los servicios de los dispositivos fuera del área geográfica donde se conecta habitualmente.

VRF: (Virtual routing and forwarding), tecnología que permite que el Router peda tener varias tablas de enrutamiento las cuales son independientes y se pueden ejecutar simultáneamente.

RESUMEN

Una red conmutada es aquella en la que se realiza una comunicación entre el origen y el destino el envío de paquetes se realiza por varios tipos de protocolos para que en un equipo central se almacene la información y se envíe cuando el enrutamiento esté disponible.

Por medio del protocolo STP se puede obtener una red back up cuando uno de los enlaces falla, esto permite que la red pueda seguir operando normalmente mientras se soluciona el enlace principal por fallas de configuración o daño de uno del host de la red adicional a esto estas redes: principal y back up no se cruzan ya que el protocolo STP evita los bucles anulando la redundancia del enlace back up cuando el principal está en funcionamiento.

Para lograr esto se debe establecer una configuración en las Vlan que permitan reconocer y eliminar los puntos de falla por medio de enrutamientos estáticos, pero no predeterminados por el fabricante, para que de esta manera se le pueda proporcionar a la red seguridad ya que los usuarios o clientes que deseen acceder deban autenticarse con uno o varios métodos de identificación de usuario.

Para esto Cisco elabora un certificado CCNP que permita certificar las competencias que se tienen al momento de diseñar y/o administrar una red ya que deacuerdo a los parámetros de Cisco se ejecutan las configuraciones que se mostraran en este documento

Palabras clave: CISCO, CCNP, conmutación, redes,

ABSTRACT

A switched network is one in which communication is carried out between the source and the destination, the sending of packets is carried out by various types of protocols so that the information is stored in a central computer and sent when routing is available.

Through the STP protocol, a backup network can be obtained when one of the links fails, this allows the network to continue operating normally while the main link is solved due to configuration failures or damage to one of the additional network hosts. These networks: main and back up do not cross since the STP protocol avoids loops by canceling the redundancy of the backup link when the main one is working.

To achieve this, a configuration must be established in the VLANs that allow the recognition and elimination of failure points through static routing, but not predetermined by the manufacturer, so that in this way security can be provided to the network since users or clients who want to access must authenticate with one or more user identification methods.

For this, Cisco prepares a CCNP certificate that allows certifying the skills that are held at the time of designing and/or managing a network, since according to Cisco parameters, the configurations that will be shown in this document are executed.

Keywords: CISCO, CCNP, switching, networks,

INTRODUCCIÓN

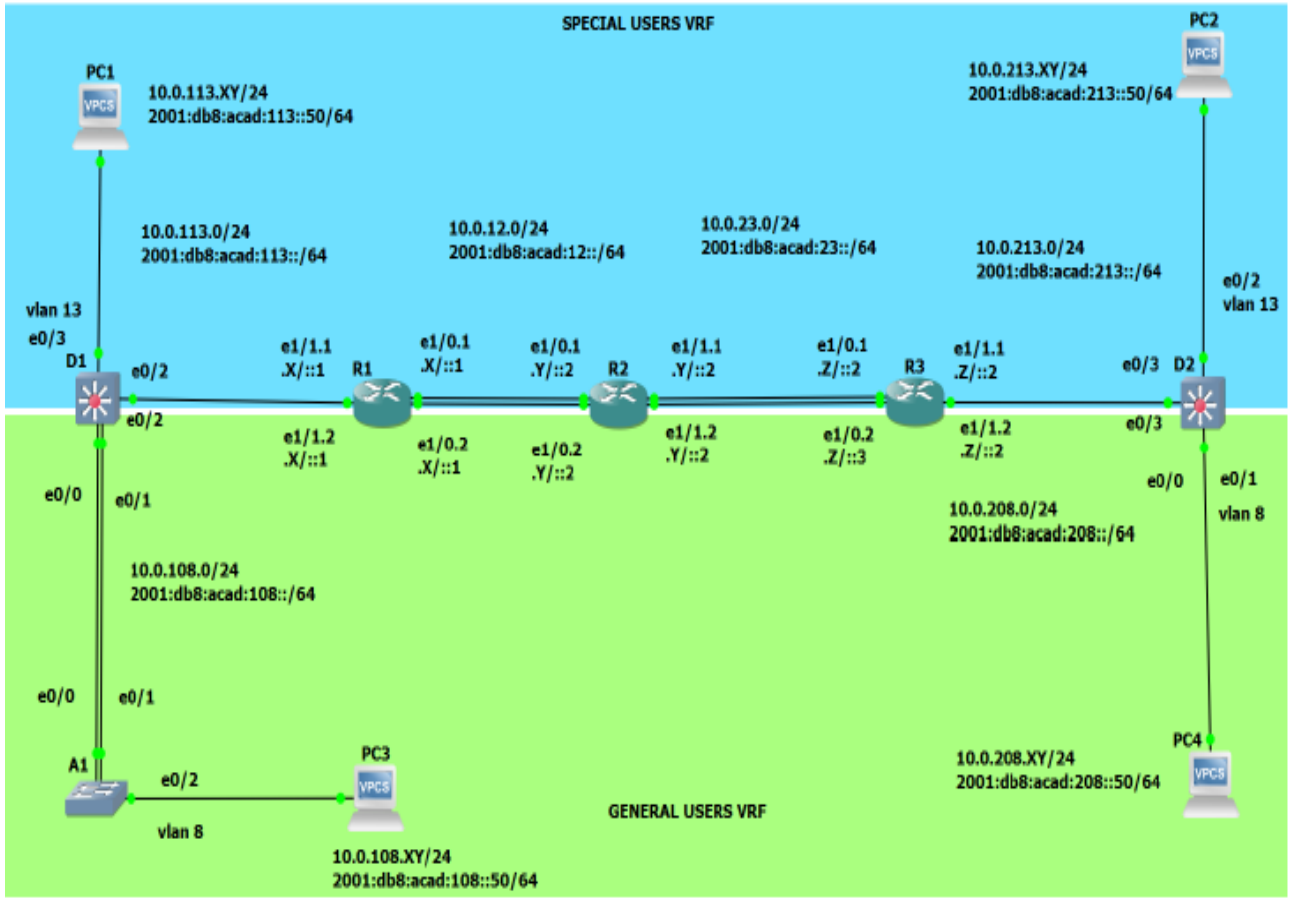
En el desarrollo de esta actividad se realizará la configuración de una red conmutada por medio del protocolo STP, donde se podrá definir los enrutamientos para cada dispositivo para que el tráfico de datos no se interrumpa si uno de los dos enlaces falla, como los Routers se configuran usando tecnología VRF se pueden generar varias tablas de enrutamiento de manera independiente ya que cada dispositivo almacena la información hasta cuando requiera ser enviada, pero esto lo hace cuando el enrutador identifique que hay una ruta libre para el envío de los paquetes almacenados.

Se realizará también la configuración de la autenticación para acceder a la red, de esta manera se podrá obtener una red segura ya que el sistema tendrá credenciales predeterminadas para todos los usuarios, pero con la posibilidad de que el usuario genere sus propias credenciales de autenticación para su ingreso exclusivo al sistema.

Para esto es necesario establecer una topología de red bien estructurada y organizada para poder identificar las direcciones ip de cada elemento de la red y de acuerdo a la jerarquía de los dispositivos en la red se podrá obtener la comunicación entre ellos sin que haya saturación de información, ya que el protocolo STP puede hacer que la red reconozca que enlace usar bloqueando el otro y solo almacenando información para su posterior envío si se requiere.

DESARROLLO DEL ESCENARIO PROPUESTO

Figura 1.Topologia de la red



Fuente: Documento final avance Escenario 1 prueba de habilidades Diplomado de profundización CISCO CCNP.

Tabla 1.Direccionamiento

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local
R1	E1/0.1	10.0.12.5/24	2001:db8:acad:12::1/64	fe80::1:1
	E1/0.2	10.0.12.5/24	2001:db8:acad:12::1/64	fe80::1:2
	E1/1.1	10.0.113.5/24	2001:db8:acad:113::1/64	fe80::1:3
	E1/1.2	10.0.108.5/24	2001:db8:acad:108::1/64	fe80::1:4
R2	E1/0.1	10.0.12.3/24	2001:db8:acad:12::2/64	fe80::2:1
	E1/0.2	10.0.12.3/24	2001:db8:acad:12::2/64	fe80::2:2
	E1/1.1	10.0.23.3/24	2001:db8:acad:23::2/64	fe80::2:3
	E1/1.2	10.0.23.3/24	2001:db8:acad:23::2/64	fe80::2:4
R3	E1/0.1	10.0.23.7/24	2001:db8:acad:23::3/64	fe80::3:1
	E1/0.2	10.0.23.7/24	2001:db8:acad:23::3/64	fe80::3:2
	E1/1.1	10.0.213.7/24	2001:db8:acad:213::1/64	fe80::3:3
	E1/1.2	10.0.208.7/24	2001:db8:acad:208::1/64	fe80::3:4
PC1	NIC	10.0.113.53/24	2001:db8:acad:113::50/64	EUI-64
PC2	NIC	10.0.213.53/24	2001:db8:acad:213::50/64	EUI-64
PC3	NIC	10.0.108.53/24	2001:db8:acad:108::50/64	EUI-64
PC4	NIC	10.0.208.53/24	2001:db8:acad:208::50/64	EUI-64

Escenario

En esta evaluación de habilidades, usted es responsable de completar la configuración multi-VRF de la red que admite "Usuarios generales" y "Usuarios especiales". Una vez finalizado, debería haber accesibilidad completa de un extremo a otro y los dos grupos no deberían poder comunicarse entre sí. Asegúrese de verificar que sus configuraciones cumplan con las especificaciones proporcionadas y que los dispositivos funcionen según lo requerido.

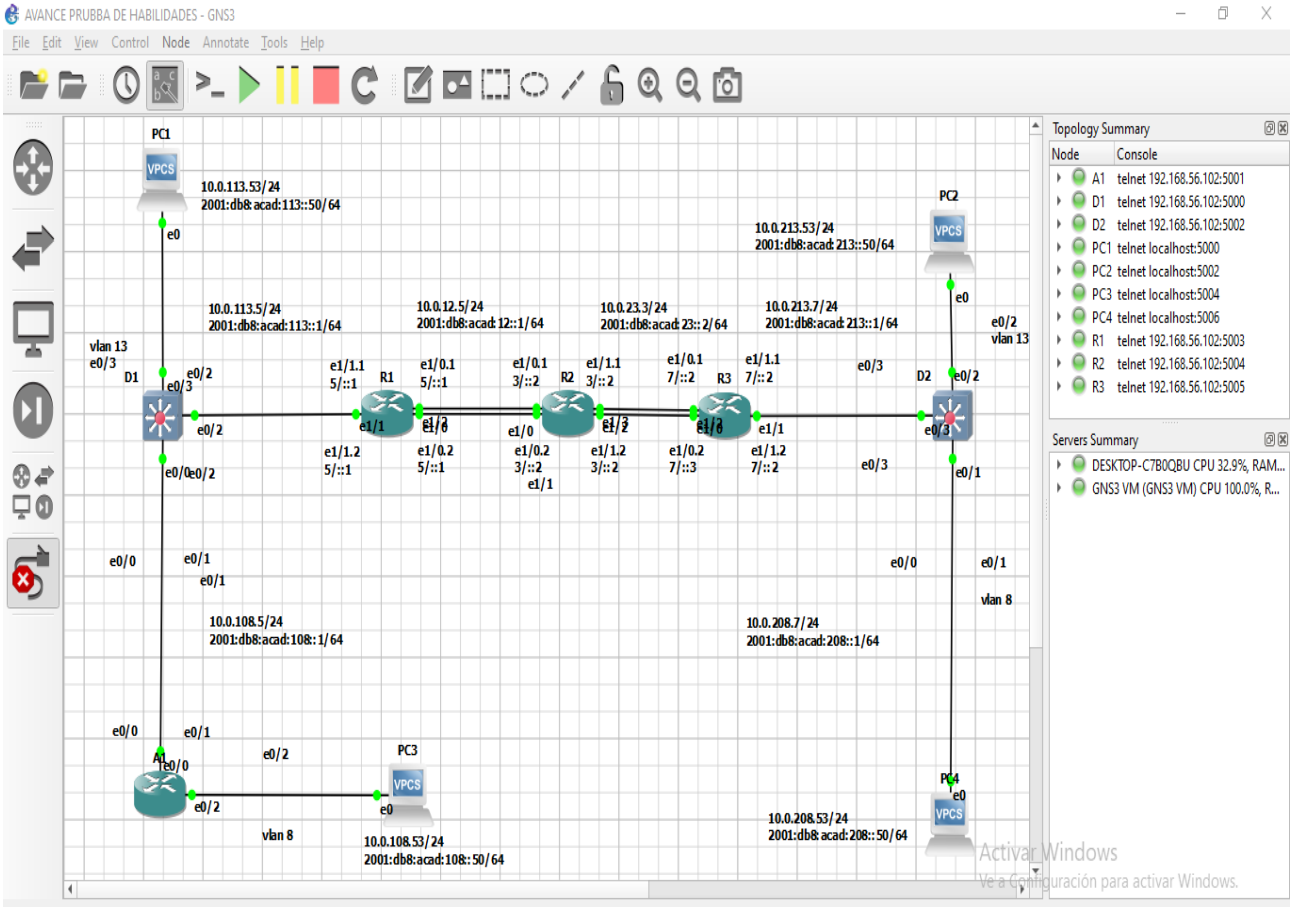
Parte 1: construir la red y configurar los ajustes básicos del dispositivo y el direccionamiento de la interfaz

En la Parte 1, configurará la topología de la red y configurará los ajustes básicos.Paso

1: Cablee la red como se muestra en la topología.

Conecte los dispositivos como se muestra en el diagrama de topología y cablee según sea necesario.

Figura 2 Conexión de dispositivos



Paso 2: Configure los ajustes básicos para cada dispositivo.

a. Ingrese al modo de configuración global en cada uno de los dispositivos y aplique la configuración básica.Las configuraciones de inicio para cada dispositivo se proporcionan a continuación.

b. Guarde las configuraciones en cada uno de los dispositivos.

Tabla 2. Ajustes básicos de dispositivo

Dispositivo	Configuración
R1	hostname R1 ipv6 unicast-routingno ip domain lookup banner motd # R1, ENCOR Skills Assessment, Scenario 2 #line con 0 exec-timeout 0 0 logging synchronous exit
R2	hostname R2 ipv6 unicast-routingno ip domain lookup banner motd # R2, ENCOR Skills Assessment, Scenario 2 #line con 0 exec-timeout 0 0 logging synchronous exit
R3	hostname R3 ipv6 unicast-routingno ip domain lookup banner motd # R3, ENCOR Skills Assessment, Scenario 2 #line con 0 exec-timeout 0 0 logging synchronous exit
D1	hostname D1 ip routing ipv6 unicast-routing no ip domain lookup banner motd # D1, ENCOR Skills Assessment, Scenario 2 # line con 0 exec-timeout 0 0 logging synchronous exit vlan 8 name General-Users exit vlan 13 name Special-Users exit

D2	hostname D2 ip routing ipv6 unicast-routing no ip domain lookup banner motd # D2, ENCOR Skills Assessment, Scenario 2 # line con 0 exec-timeout 0 0 logging synchronous exit vlan 8 name General-Users exit vlan 13 name Special-Users exit
A1	hostname A1 ipv6 unicast-routing no ip domain lookup banner motd # A1, ENCOR Skills Assessment, Scenario 2 # line con 0 exec-timeout 0 0 logging synchronous exit vlan 8 name General-Users exit

Figure 3 Configuración básica R1

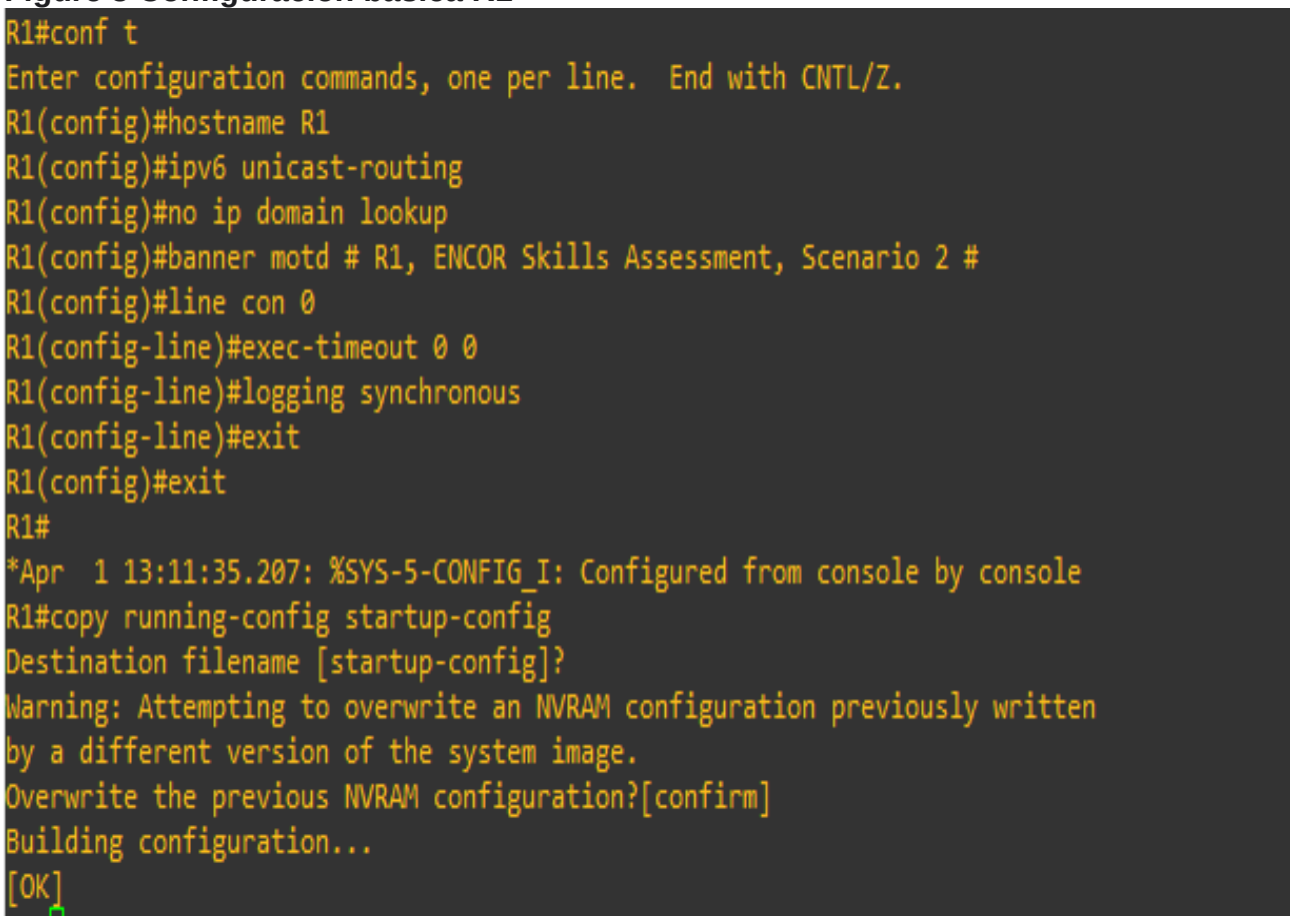


Figura 4Configuración básica R2

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#hostname R2
R2(config)#ipv6 unicast-routing
R2(config)#no ip domain lookup
R2(config)#banner motd # R2, ENCOR Skills Assessment, Scenario 2 #
R2(config)#line con 0
R2(config-line)#exec-timeout 0 0
R2(config-line)#logging synchronous
R2(config-line)#exit
R2(config)#exit
R2#
*Apr  1 13:15:09.623: %SYS-5-CONFIG_I: Configured from console by console
R2#copy running-congig startup-config
%Error parsing filename (No such device)
R2#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
```

Figura 5 Configuración básica R3

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#hostname R3
R3(config)#ipv6 unicast-routing
R3(config)#no ip domain lookup
R3(config)#banner motd # R3, ENCOR Skills Assessment, Scenario 2 #
R3(config)#line con 0
R3(config-line)#exec-timeout 0 0
R3(config-line)#logging synchronous
R3(config-line)#exit
R3(config)#exit
R3#co
*Apr  1 13:17:58.355: %SYS-5-CONFIG_I: Configured from console by console
R3#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
[OK]
```

Figura 6 Configuración básica D1

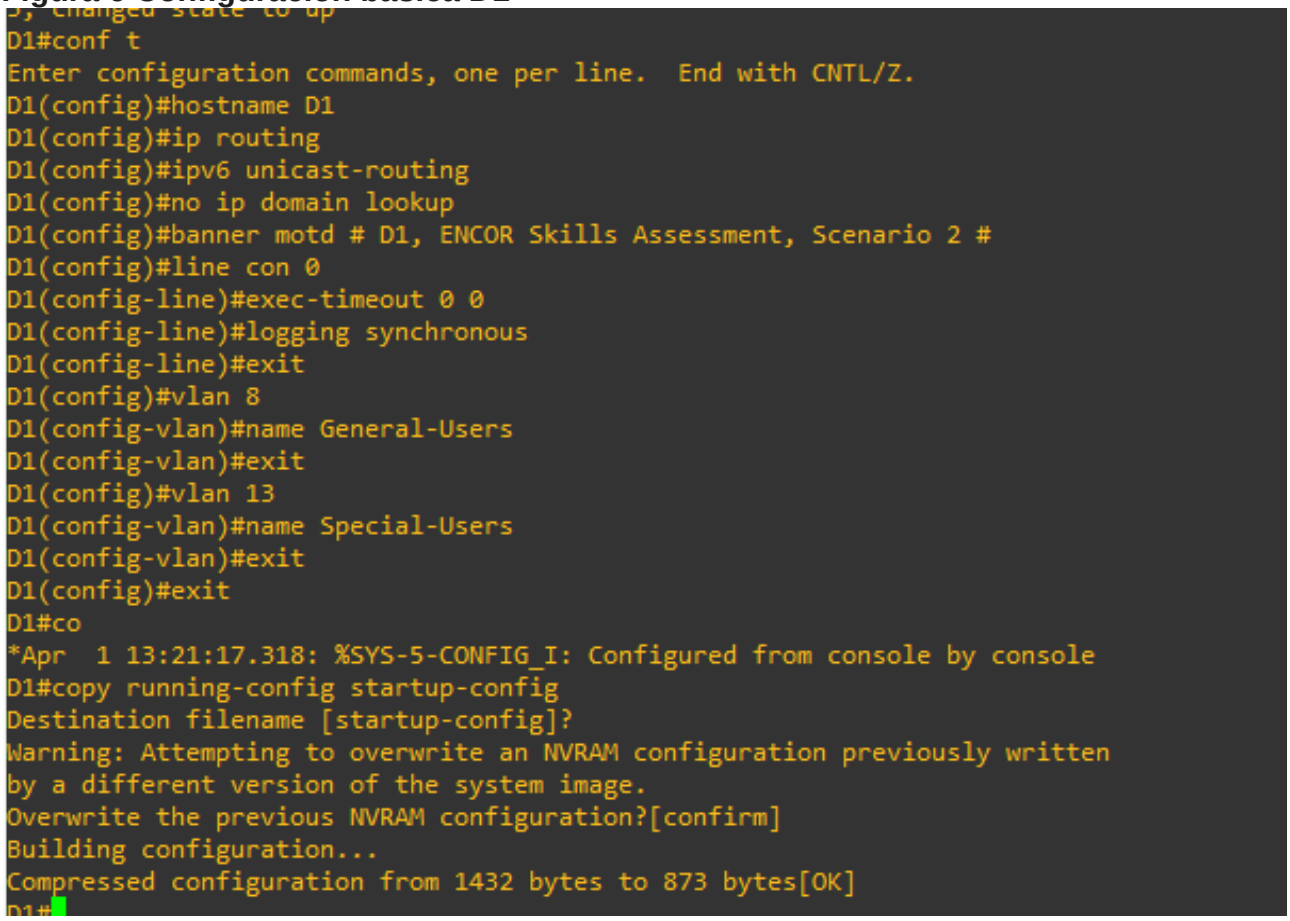


Figura 7Configuración básica D2

```
D2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
D2(config)#hostname D2
D2(config)#ip routing
D2(config)#ipv6 unicast-routing
D2(config)#no ip domain lookup
D2(config)#banner motd # D2, ENCOR Skills Assessment, Scenario 2 #
D2(config)#line con 0
D2(config-line)#exec-timeout 0 0
D2(config-line)#logging synchronous
D2(config-line)#exit
D2(config)#vlan 8
D2(config-vlan)#name General-Users
D2(config-vlan)#exit
D2(config)#vlan 13
D2(config-vlan)#name Special-Users
D2(config-vlan)#exit
D2(config)#exit
D2#c
*Apr  1 13:24:23.782: %SYS-5-CONFIG_I: Configured from console by console
D2#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
Compressed configuration from 1432 bytes to 874 bytes[OK]
```

Figura 8 Configuración básica A1

```
A1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
A1(config)#hostname A1
A1(config)#ipv6 unicast-routing
A1(config)#no ip domain lookup
A1(config)#banner motd # A1, ENCOR Skills Assessment, Scenario 2 #
A1(config)#line con 0
A1(config-line)#exec-timeout 0 0
A1(config-line)#logging synchronous
A1(config-line)#exit
A1(config)#vlan 8
A1(config-vlan)#name General-Users
A1(config-vlan)#exit
A1(config)#exit
A1#
*Apr  1 13:28:02.591: %SYS-5-CONFIG_I: Configured from console by console
A1#copy running-config startup-config
Destination filename [startup-config]?
Warning: Attempting to overwrite an NVRAM configuration previously written
by a different version of the system image.
Overwrite the previous NVRAM configuration?[confirm]
Building configuration...
Compressed configuration from 1712 bytes to 938 bytes[OK]
```

c. Configure los PC1, PC2, PC3 y PC4 de acuerdo con la tabla de direccionamiento.

Tabla 3. Configuraciones PC

PC1	PC1> ip 10.0.113.53/24 10.0.113.1 PC1> ip 2001:db8:acad:113::50/64 PC1> show ip
PC 2	PC2> ip 10.0.213.53/24 10.0.213.1 PC2> ip 2001:db8:acad:213::50/64 PC2> show ip
PC 3	PC3> ip 10.0.108.53/24 10.0.108.1 PC3> ip 2001:db8:acad:108::50/64 PC3> show ip
PC 4	PC4> ip 10.0.208.53/24 10.0.208.1 PC4> ip 2001:db8:acad:208::50/64 PC4> show ip

Figura 9 . Configuración PC1

```
PC1>  ip 10.0.113.53/24 10.0.113.1
Checking for duplicate address...
PC1 : 10.0.113.53 255.255.255.0 gateway 10.0.113.1

PC1>  ip 2001:db8:acad:113::50/64
PC1 : 2001:db8:acad:113::50/64

PC1> > show ip
Bad command: "> show ip". Use ? for help.

PC1>  show ip

NAME        : PC1[1]
IP/MASK     : 10.0.113.53/24
GATEWAY     : 10.0.113.1
DNS         :
MAC         : 00:50:79:66:68:00
LPORT       : 20039
RHOST:PORT  : 127.0.0.1:20040
MTU         : 1500
```

Figura 10 Configuración PC2

```
PC2> ip 10.0.213.53/24 10.0.213.1
Checking for duplicate address...
PC2 : 10.0.213.53 255.255.255.0 gateway 10.0.213.1

PC2> ip 2001:db8:acad:213::50/64
PC1 : 2001:db8:acad:213::50/64

PC2> show ip

NAME        : PC2[1]
IP/MASK     : 10.0.213.53/24
GATEWAY     : 10.0.213.1
DNS         :
MAC         : 00:50:79:66:68:01
LPORT       : 20042
RHOST:PORT  : 127.0.0.1:20043
MTU         : 1500
```

Figura 11 Configuración PC3

```
PC3> ip 10.0.108.53/24 10.0.108.1
Checking for duplicate address...
PC3 : 10.0.108.53 255.255.255.0 gateway 10.0.108.1

PC3> ip 2001:db8:acad:108::50/64
PC1 : 2001:db8:acad:108::50/64

PC3> show ip

NAME          : PC3[1]
IP/MASK       : 10.0.108.53/24
GATEWAY       : 10.0.108.1
DNS           :
MAC           : 00:50:79:66:68:02
LPORT         : 20045
RHOST:PORT    : 127.0.0.1:20046
MTU           : 1500
```

Figura 12 . Configuración PC4

```
PC4> ip 10.0.208.53/24 10.0.208.1
Checking for duplicate address...
PC4 : 10.0.208.53 255.255.255.0 gateway 10.0.208.1

PC4> ip 2001:db8:acad:208::50/64
PC1 : 2001:db8:acad:208::50/64

PC4> show ip

NAME        : PC4[1]
IP/MASK     : 10.0.208.53/24
GATEWAY     : 10.0.208.1
DNS         :
MAC         : 00:50:79:66:68:03
LPORT       : 20048
RHOST:PORT  : 127.0.0.1:20049
MTU         : 1500
```

Parte 2: configurar VRF y enrutamiento estático

En esta parte de la evaluación de habilidades, configurará VRF-Lite en los tres enrutadores y las rutas estáticas adecuadas para admitir la accesibilidad de un extremo a otro. Al final de esta parte, R1 debería poder hacer pinga R3 en cada VRF.

Sus tareas de configuración son las siguientes:

Task#	Task	Specification
2.1	On R1, R2, and R3, configure VRF-Lite VRFs as shown in the topology diagram.	Configure two VRFs: • General-Users • Special-Users The VRFs must support IPv4 and IPv6.
2.2	On R1, R2, and R3, configure IPv4 and IPv6 interfaces on each VRF as detailed in the addressing table above.	All routers will use Router-On-A-Stick on their e1/1.x interfaces to support separation of the VRFs. Sub-interface 1: • In the Special Users VRF • Use dot1q encapsulation • IPv4 and IPv6 GUA and link-local addresses • Enable the interfaces Sub-interface 2: • In the General Users VRF • Use dot1q encapsulation • IPv4 and IPv6 GUA and link-local addresses • Enable the interfaces
2.3	On R1 and R3, configure default static routes pointing to R2.	Configure VRF static routes for both IPv4 and IPv6 in both VRFs.
2.4	Verify connectivity in each VRF.	From R1, verify connectivity to R3: • ping vrf General-Users 10.0.208.Z • ping vrf General-Users 2001:db8:acad:208::1 • ping vrf Special-Users 10.0.213.Z • ping vrf Special-Users 2001:db8:acad:213::1

Tabla 4. 2.1 On R1, R2, and R3, configure VRF-Lite VRFs as shown in the topology

VRF R1	R1#conf t R1(config)#vrf definition Special-Users R1(config-vrf)#address-family ipv4 R1(config-vrf-af)#address-family ipv6 R1(config-vrf-af)#exit R1(config-vrf)#exit R1(config)#vrf definition General-Users R1(config-vrf)#address-family ipv4 R1(config-vrf-af)#address-family ipv6 R1(config-vrf-af)#exit R1(config-vrf)#exit R1(config)#exit R1#wr
VRF R2	R2#conf t R2(config)#vrf definition Special-Users R2(config-vrf)#address-family ipv4 R2(config-vrf-af)#address-family ipv6 R2(config-vrf-af)#exit R2(config-vrf)#exit R2(config)#vrf definition General-Users R2(config-vrf)#address-family ipv4 R2(config-vrf-af)#address-family ipv6 R2(config-vrf-af)#exit R2(config-vrf)#exit R2(config)#exit R2#wr

VRF R3	R3#conf t R3(config)#vrf definition Special-Users R3(config-vrf)#address-family ipv4 R3(config-vrf-af)#address-family ipv6 R3(config-vrf-af)#exit R3(config-vrf)#exit R3(config)#vrf definition General-Users R3(config-vrf)#address-family ipv4 R3(config-vrf-af)#address-family ipv6 R3(config-vrf-af)#exit R3(config-vrf)#exit R3(config)#exit R3#wr

Figura 13 . Configuración VRF R1

```
R1#
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#vrf definition Special-Users
R1(config-vrf)#address-family ipv4
R1(config-vrf-af)#address-family ipv6
R1(config-vrf-af)#exit
R1(config-vrf)#exit
R1(config)#vrf definition General-Users
R1(config-vrf)#address-family ipv4
R1(config-vrf-af)#address-family ipv6
R1(config-vrf-af)#exit
R1(config-vrf)#exit
R1(config)#wr
           ^
% Invalid input detected at '^' marker.

R1(config)#exit
R1#
*Apr  1 14:00:16.999: %SYS-5-CONFIG_I: Configured from console by console
R1#wr
Building configuration...
[OK]
```

Figura 14 . Configuración VRF R2

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#vrf definition Special-Users
R2(config-vrf)#address-family ipv4
R2(config-vrf-af)#address-family ipv6
R2(config-vrf-af)#exit
R2(config-vrf)#exit
R2(config)#vrf definition General-Users
R2(config-vrf)#address-family ipv4
R2(config-vrf-af)#address-family ipv6
R2(config-vrf-af)#exit
R2(config-vrf)#exit
R2(config)#exit
R2#
*Apr  1 14:02:57.531: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
[OK]
```

Figura 15 . Configuración VRF R3

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#vrf definition Special-Users
R3(config-vrf)#address-family ipv4
R3(config-vrf-af)#address-family ipv6
R3(config-vrf-af)#exit
R3(config-vrf)#exit
R3(config)#vrf definition General-Users
R3(config-vrf)#address-family ipv4
R3(config-vrf-af)#address-family ipv6
R3(config-vrf-af)#exit
R3(config-vrf)#exit
R3(config)#exit
R3#
*Apr  1 14:07:25.503: %SYS-5-CONFIG_I: Configured from console by console
R3#wr
Building configuration...
[OK]
```

Tabla 52.2 On R1, R2, and R3, configure IPv4 and IPv6 interfaces on each VRF as detailed in the addressing table above.

R1 IPv4-IPv6	R1(config)#int e1/0 R1(config-if)#no shutdown R1(config-if)#int e1/0.1 R1(config-subif)#encapsulation dot1Q 13 R1(config-subif)#vrf forwarding Special-Users R1(config-subif)#ip address 10.0.12.5 255.255.255.0 R1(config-subif)#ipv6 address fe80::1:1 link-local R1(config-subif)#ipv6 address 2001:db8:acad:12::1/64 R1(config-subif)#no shutdown R1(config-subif)#exit R1(config)#int e1/0.2 R1(config-subif)#encapsulation dot1Q 8 R1(config-subif)#vrf forwarding General-Users R1(config-subif)#ip address 10.0.12.5 255.255.255.0 R1(config-subif)#ipv6 address 2001:db8:acad:12::1/64 R1(config-subif)#ipv6 address fe80::1:2 link-local R1(config-subif)#no shutdown R1(config-subif)#exit R1(config)#int e1/1.0 R1(config-if)#no shutdown R1(config-if)#int e1/1.1 R1(config-subif)#encapsulation dot1Q 13 R1(config-subif)#ip address 10.0.113.5 255.255.255.0 R1(config-subif)#ipv6 address R1(config-subif)#ipv6 address 2001:db8:acad:113::1/64 R1(config-subif)#ipv6 address fe80::1:3 link-local R1(config-subif)#no shutdown R1(config-subif)#exit R1(config)#int e1/1.2 R1(config)#int e1/1.2

	R1(config-subif)#encapsulation dot1Q 8 R1(config-subif)#vrf forward General-Users R1(config-subif)#ip address 10.0.108.5 255.255.255.0 R1(config-subif)#ipv6 address 2001:db8:acad:108::1/64 R1(config-subif)#ipv6 address fe80::1:4 link-local R1(config-subif)#no shutdown R1(config-subif)#exit R1(config)#exit R1#wr
R2 IPv4-IPv6	R2#conf t R2(config)#int e1/0 R2(config-if)#no shutdown R2(config-if)#int e1/0.1 R2(config-subif)#encapsulation dot1Q 13 R2(config-subif)#vrf forwarding Special-Users R2(config-subif)#ip address 10.0.12.3 255.255.255.0 R2(config-subif)#ipv6 address fe80::2:1 link-local R2(config-subif)#ipv6 address 2001:db8:acad:12::2/64 R2(config-subif)#no shutdown R2(config-subif)#exit R2(config)#int e1/0.2 R2(config-subif)#encapsulation dot1Q 8 R2(config-subif)#vrf forwarding General-Users R2(config-subif)#ip address 10.0.12.3 255.255.255.0 R2(config-subif)#ipv6 address 2001:db8:acad:12::2/64 R2(config-subif)#ipv6 address fe80::2:2 link-local R2(config-subif)#no shutdown R2(config-subif)#exit R2(config)#int e1/1.0 R2(config-if)#no shutdown

	R2(config-if)#int e1/1.1 R2(config-subif)#encapsulation dot1Q 13 R2(config-subif)#vrf forwarding Special-Users R2(config-subif)#ip address 10.0.23.3 255.255.255.0 R2(config-subif)#ipv6 address 2001:db8:acad:23::2/64 R2(config-subif)#ipv6 address fe80::2:3 link-local R2(config-subif)#no shutdown R2(config-subif)#exit R2(config)#int e1/1.2 R2(config-subif)#encapsulation dot1Q 8 R2(config-subif)#vrf forward General-Users R2(config-subif)#ip address 10.0.23.3 255.255.255.0 R2(config-subif)#ipv6 address 2001:db8:acad:23::2/64 R2(config-subif)#ipv6 address fe80::2:4 link-local R2(config-subif)#no shutdown R2(config-subif)#exit R2(config)#exit R2#wr
R3 IPv4-IPv6	R3(config)#int e1/0 R3(config-if)#no shutdown R3(config-if)#int e1/0.1 R3(config-subif)#encapsulation dot1Q 13 R3(config-subif)#vrf forwarding Special-Users R3(config-subif)#ip address 10.0.23.7 255.255.255.0 R3(config-subif)#ipv6 address fe80::3:1 link-local R3(config-subif)#ipv6 address 2001:db8:acad:23::3/64 R3(config-subif)#no shutdown R3(config-subif)#exit R3(config)#int e1/0.2 R3(config-subif)#encapsulation dot1Q 8 R3(config-subif)#vrf forwarding General-Users

	R3(config-subif)#ip address 10.0.23.7 255.255.255.0 R3(config-subif)#ipv6 address 2001:db8:acad:23::3/64 R3(config-subif)#ipv6 address fe80::3:2 link-local R3(config-subif)#no shutdown R3(config-subif)#exit R3(config)#int e1/1.0 R3(config-if)#no shutdown R3(config-if)#int e1/1.1 R3(config-subif)#encapsulation dot1Q 13 R3(config-subif)#vrf forwarding Special-Users R3(config-subif)#ip address 10.0.213.7 255.255.255.0 R3(config-subif)#ip address 10.0.213.7 255.255.255.0 R3(config-subif)#ipv6 address 2001:db8:acad:213::1/64 R3(config-subif)#ipv6 address link-local R3(config-subif)#ipv6 address fe80::3:3 link-local R3(config-subif)#no shutdown R3(config-subif)#exit R3(config)#int e1/1.2 R3(config-subif)#encapsulation dot1Q 8 R3(config-subif)#vrf forward General-Users R3(config-subif)#ip address 10.0.208.7 255.255.255.0 R3(config-subif)#ipv6 address 2001:db8:acad:208::1/64 R3(config-subif)#ipv6 address fe80::3:4 link-local R3(config-subif)#no shutdown R3(config-subif)#exit R3(config)#exit R3#wr

Figura 16 Validación VRF R1

```
R1#show ip vrf int
Interface              IP-Address      VRF                            Protocol
Et1/0.2                10.0.12.5       General-Users                  up
Et1/1.2                10.0.108.5      General-Users                  up
Et1/0.1                10.0.12.5       Special-Users                  up
Et1/1.1                10.0.113.5      Special-Users                  up
R1#
```

Figura 17 Validación VRF R2

```
R2#show ip vrf int
Interface              IP-Address      VRF                            Protocol
Et1/0.2                10.0.12.3       General-Users                  up
Et1/1.2                10.0.23.3       General-Users                  up
Et1/0.1                10.0.12.3       Special-Users                  up
Et1/1.1                10.0.23.3       Special-Users                  up
```

Figura 18 Validación VRF R3

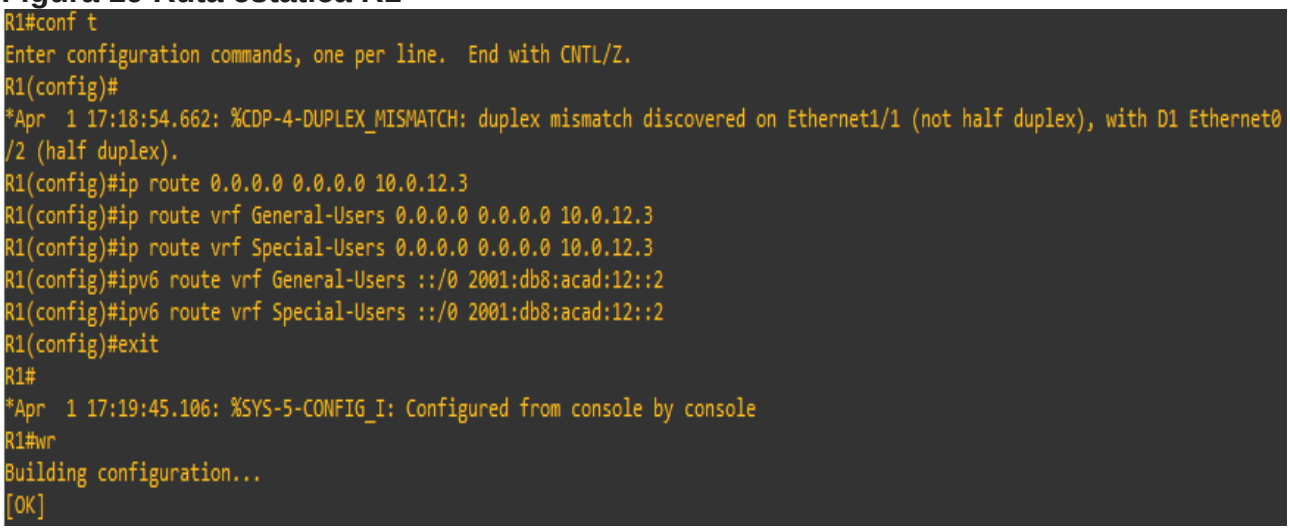
```
R3#show ip vrf int
Interface              IP-Address      VRF                            Protocol
Et1/0.2                10.0.23.7       General-Users                  up
Et1/1.2                10.0.208.7      General-Users                  up
Et1/0.1                10.0.23.7       Special-Users                  up
Et1/1.1                10.0.213.7      Special-Users                  up
R3#
```

Tabla 6. 2.3 On R1 and R3, configure default static routes pointing to R2.

Ruta estática R1	R1(config)#ip route 0.0.0.0 0.0.0.0 10.0.12.3 R1(config)#ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.12.3 R1(config)#ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.12.3 R1(config)#ipv6 route vrf General-Users ::/0 2001:db8:acad:12::2 R1(config)#ipv6 route vrf Special-Users ::/0 2001:db8:acad:12::2 R1(config)#exit R1#wr
Ruta estática R2	config t ip route vrf General-Users 10.0.108.0 255.255.255.0 10.0.12.5 ip route vrf General-Users 10.0.208.0 255.255.255.0 10.0.23.7 ip route vrf Special-Users 10.0.113.0 255.255.255.0 10.0.12.5 ip route vrf Special-Users 10.0.213.0 255.255.255.0 10.0.23.7 ipv6 route vrf General-Users 2001:db8:acad:108::/64 2001:db8:acad:12::1 ipv6 route vrf General-Users 2001:db8:acad:208::/64 2001:db8:acad:23::3 ipv6 route vrf Special-Users 2001:db8:acad:113::/64 2001:db8:acad:12::1 ipv6 route vrf Special-Users 2001:db8:acad:213::/64 2001:db8:acad:23::3 exit wr
Ruta estática R3	config t ip route 0.0.0.0 0.0.0.0 10.0.23.3 ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.23.3 ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.23.3 ipv6 route vrf General-Users ::/0 2001:db8:acad:23::2 ipv6 route vrf Special-Users ::/0 2001:db8:acad:23::2

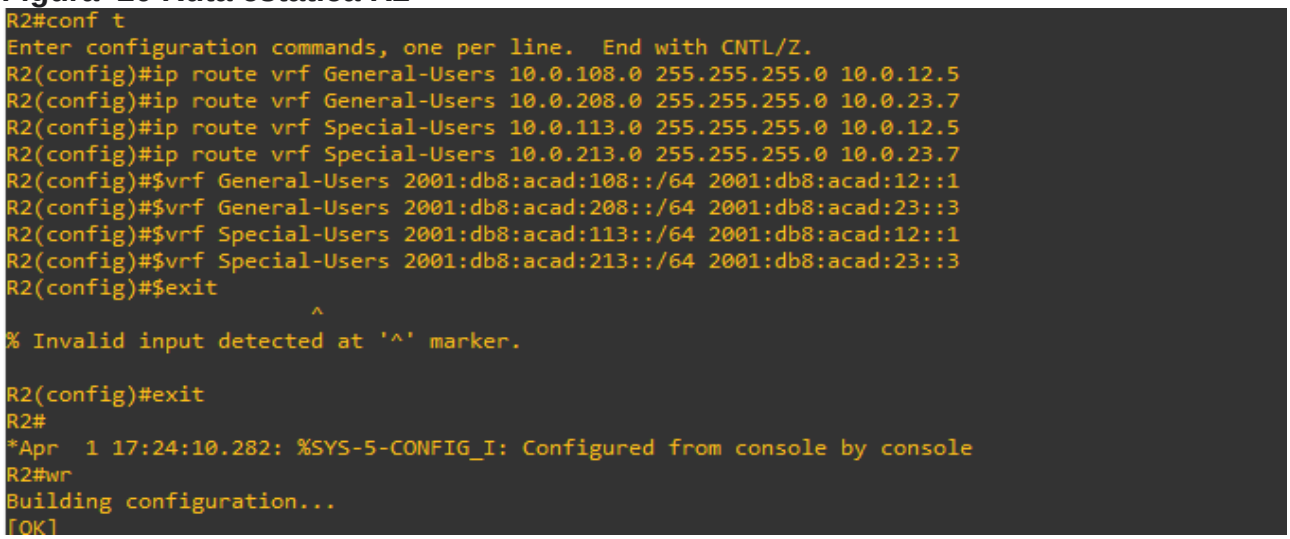
	exit wr

Figura 19 Ruta estática R1



```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#
*Apr  1 17:18:54.662: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/1 (not half duplex), with D1 Ethernet0
/2 (half duplex).
R1(config)#ip route 0.0.0.0 0.0.0.0 10.0.12.3
R1(config)#ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.12.3
R1(config)#ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.12.3
R1(config)#ipv6 route vrf General-Users ::/0 2001:db8:acad:12::2
R1(config)#ipv6 route vrf Special-Users ::/0 2001:db8:acad:12::2
R1(config)#exit
R1#
*Apr  1 17:19:45.106: %SYS-5-CONFIG_I: Configured from console by console
R1#wr
Building configuration...
[OK]
```

Figura 20 Ruta estática R2



```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip route vrf General-Users 10.0.108.0 255.255.255.0 10.0.12.5
R2(config)#ip route vrf General-Users 10.0.208.0 255.255.255.0 10.0.23.7
R2(config)#ip route vrf Special-Users 10.0.113.0 255.255.255.0 10.0.12.5
R2(config)#ip route vrf Special-Users 10.0.213.0 255.255.255.0 10.0.23.7
R2(config)#$vrf General-Users 2001:db8:acad:108::/64 2001:db8:acad:12::1
R2(config)#$vrf General-Users 2001:db8:acad:208::/64 2001:db8:acad:23::3
R2(config)#$vrf Special-Users 2001:db8:acad:113::/64 2001:db8:acad:12::1
R2(config)#$vrf Special-Users 2001:db8:acad:213::/64 2001:db8:acad:23::3
R2(config)#$exit
                    ^
% Invalid input detected at '^' marker.

R2(config)#exit
R2#
*Apr  1 17:24:10.282: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
[OK]
```

Figura 21 Ruta estática R2

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#
*Apr  1 17:27:08.606: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/1 (not half duplex), with D2 Ethernet0
/3 (half duplex).
R3(config)#ip route 0.0.0.0 0.0.0.0 10.0.23.3
R3(config)#ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.23.3
R3(config)#ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.23.3
R3(config)#ipv6 route vrf General-Users ::/0 2001:db8:acad:23::2
R3(config)#ipv6 route vrf Special-Users ::/0 2001:db8:acad:23::2
*Apr  1 17:27:57.686: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/1 (not half duplex), with D2 Ethernet0
/3 (half duplex).
R3(config)#ipv6 route vrf Special-Users ::/0 2001:db8:acad:23::2
R3(config)#exit
R3#
*Apr  1 17:28:11.194: %SYS-5-CONFIG_I: Configured from console by console
R3#wr
Building configuration...
[OK]
```

2.4 Verify connectivity in each VRF.

Figura 22 . ping vrf General-Users 10.0.208.

```
R1#ping vrf General-Users 10.0.208.7
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.0.208.7, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Figura 23 ping vrf General-Users 2001:db8:acad:208::1

```
R1#ping vrf General-Users 2001:db8:acad:208::1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:208::1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Figura 24 ping vrf Special-Users 10.0.213.7

```
R1#ping vrf Special-Users 10.0.213.7
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.0.213.7, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Figura 25 . ping vrf Special-Users 2001:db8:acad:213::1

```
R1#ping vrf Special-Users 2001:db8:acad:213::1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:ACAD:213::1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)
```

Figure 26.R1# show run | inc route

```
R1#show run | inc route
ip route 0.0.0.0 0.0.0.0 10.0.12.3
ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.12.3
ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.12.3
ipv6 route vrf General-Users ::/0 2001:DB8:ACAD:12::2
ipv6 route vrf Special-Users ::/0 2001:DB8:ACAD:12::2
R1#
```

Figure 27.R2# show run | inc route

```
R2#show run | inc route
ip route vrf General-Users 10.0.108.0 255.255.255.0 10.0.12.5
ip route vrf General-Users 10.0.208.0 255.255.255.0 10.0.23.7
ip route vrf Special-Users 10.0.113.0 255.255.255.0 10.0.12.5
ip route vrf Special-Users 10.0.213.0 255.255.255.0 10.0.23.7
ipv6 route vrf General-Users 2001:DB8:ACAD:108::/64 2001:DB8:ACAD:12::1
ipv6 route vrf Special-Users 2001:DB8:ACAD:113::/64 2001:DB8:ACAD:12::1
ipv6 route vrf General-Users 2001:DB8:ACAD:208::/64 2001:DB8:ACAD:23::3
ipv6 route vrf Special-Users 2001:DB8:ACAD:213::/64 2001:DB8:ACAD:23::3
R2#
```

Figure 28 R3# show run | inc route

```
R3#show run | inc route
ip route 0.0.0.0 0.0.0.0 10.0.23.3
ip route vrf General-Users 0.0.0.0 0.0.0.0 10.0.23.3
ip route vrf Special-Users 0.0.0.0 0.0.0.0 10.0.23.3
ipv6 route vrf General-Users ::/0 2001:DB8:ACAD:23::2
ipv6 route vrf Special-Users ::/0 2001:DB8:ACAD:23::2
R3#
```

Parte 3. Configurar Capa 2

En esta parte, tendrá que configurar los Switches para soportar la conectividad con los dispositivos finales.

Las tareas de configuración, son las siguientes:

Task#	Task	Specification
3.1	On D1, D2, and A1, disable all interfaces.	
3.2	On D1 and D2, configure the trunk links to R1 and R3.	Configure and enable the e0/3 link as a trunk link.
3.3	On D1 and A1, configure the EtherChannel.	On D1, configure and enable: • Interface e0/0 and e0/1 • Port Channel 1 using PAgPOn A1, configure enable: • Interface E0/0 and E0/1 • Port Channel 1 using PAgP
3.4	On D1, D2, and A1, configure access ports for PC1, PC2, PC3, and PC4.	Configure and enable the access ports as follows: • On D1, configure interface E0/3 as an accessport in VLAN 13 and enable Portfast. • On D2, configure interface E0/2 as an accessport in VLAN 13 and enable Portfast. • On D2, configure interface E0/1 as an accessport in VLAN 8 and enable Portfast. • On A1, configure interface E0/2 as an accessport in VLAN 8 and enable Portfast.
3.5	Verify PC to PC connectivity.	From PC1, verify IPv4 and IPv6 connectivity to PC2. From PC3, verify IPv4 and IPv6 connectivity to PC4.

Tabla 7.3.1 Deshabilitar interfaces

D1	conf t D1(config)#$net 0/0-3, ethernet 1/0-3, ethernet 2/0-3, ethernet 3/0-3 D1(config-if-range)#shutdown D1(config-if-range)#exit
D2	conf t D2(config)#$net 0/0-3, ethernet 1/0-3, ethernet 2/0-3, ethernet 3/0-3 D2(config-if-range)#shutdown D2(config-if-range)#exit
A1	CONF T A1(config)#interface range ethernet 0/0-3, ethernet 1/0-3 A1(config-if-range)#shutdown A1(config-if-range)#EXIT

Table 7.3.2 On D1 and D2, configure the trunk links to R1 and R3.

D1	D1#conf t Enter configuration commands, one per line. End with CNTL/Z. D1(config)#inter ether 0/0 D1(config-if)#switchport trunk encapsulation dot1Q D1(config-if)#switchport mode trunk D1(config-if)#switchport trunk allowed Vlan 13,8 D1(config-if)#no shutdown D1(config-if)# *May 10 03:09:00.019: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up D1(config-if)# *May 10 03:09:02.024: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up D1(config-if)#exit
D2	D2(config)#inter ether 0/0 D2(config-if)#switchport trunk encapsulation dot1Q D2(config-if)#switchport mode trunk D2(config-if)#switchport trunk allowed Vlan 13,8 D2(config-if)#no shutdown D2(config-if)# *May 10 03:12:12.976: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up D2(config-if)# *May 10 03:12:14.980: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up D2(config-if)#exit D2(config)#

Table 7.3.3On D1 and A1, configure the EtherChannel.

D1	D1(config)#inter range e1/0-1 D1(config-if-range)#switchport trunk encapsulation dot1Q D1(config-if-range)#switchport mode trunk D1(config-if-range)#channel-group 1 mode desirable Creating a port-channel interface Port-channel 1 D1(config-if-range)#no shutdown
A1	A1(config)#inter range e1/0-1 A1(config-if-range)#switchport trunk encapsulation dot1Q A1(config-if-range)#switchport mode trunk A1(config-if-range)#channel-group 1 mode desirable Creating a port-channel interface Port-channel 1 A1(config-if-range)#no shutdown

Table7.3.4 On D1, D2, and A1, configure access ports for PC1, PC2, PC3, and PC4.

D1	D1(config)#inter e0/0 D1(config-if)#switchport mode Access D1(config-if)#switchport access vlan 13 D1(config-if)#spanning-tree portfast %Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc... to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION %Portfast has been configured on Ethernet0/0 but will only have effect when the interface is in a non-trunking mode. D1(config-if)#no shutdown D1(config-if)#exit
D2	D2(config)#inter e0/0 D2(config-if)#switchport mode Access D2(config-if)#switchport access vlan 13 D2(config-if)#spanning-tree portfast %Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc... to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION %Portfast has been configured on Ethernet0/0 but will only have effect when the interface is in a non-trunking mode. D2(config-if)#no shutdown D2(config-if)#exit D2(config)#inter e1/0 D2(config-if)#switchport mode Access D2(config-if)#switchport access vlan 8 D2(config-if)#spanning-tree portfast %Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc... to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION %Portfast has been configured on Ethernet1/0 but will only have effect when the interface is in a non-trunking mode. D2(config-if)#no shutdown D2(config-if)# *May 10 03:27:48.995: %LINK-3-UPDOWN: Interface Ethernet1/0, changed state to up *May 10 03:27:50.000: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to up D2(config-if)#exit D2(config)#exit
A1	A1(config)#inter e0/0

	A1(config-if)#switchport mode Access A1(config-if)#switchport access vlan 8 A1(config-if)#spanning-tree portfast %Warning: portfast should only be enabled on ports connected to a single host. Connecting hubs, concentrators, switches, bridges, etc... to this interface when portfast is enabled, can cause temporary bridging loops. Use with CAUTION %Portfast has been configured on Ethernet0/0 but will only have effect when the interface is in a non-trunking mode. A1(config-if)#no shutdown A1(config-if)# *May 10 03:29:30.561: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up *May 10 03:29:31.566: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up A1(config-if)# *May 10 03:30:01.991: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/0 (8), with D1 Ethernet0/0 (13). A1(config-if)#exit A1(config)#exit

3.5 Verify PC to PC connectivity**.**

Figure 29 CONECTIVIDAD PC1-PC2

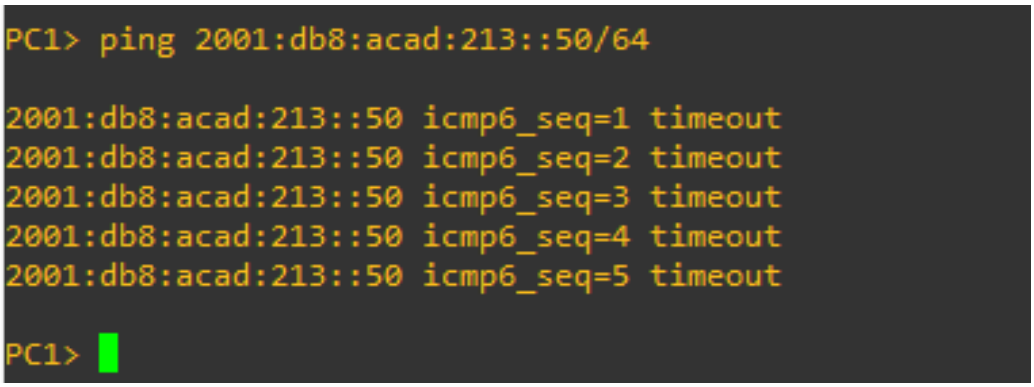


Figure 30 PING PC3-PC4

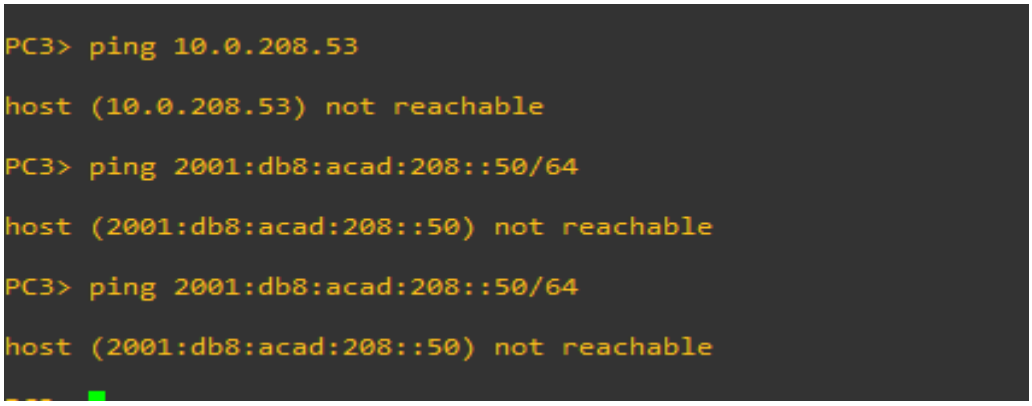


Figure 31 D1# show interfaces trunk

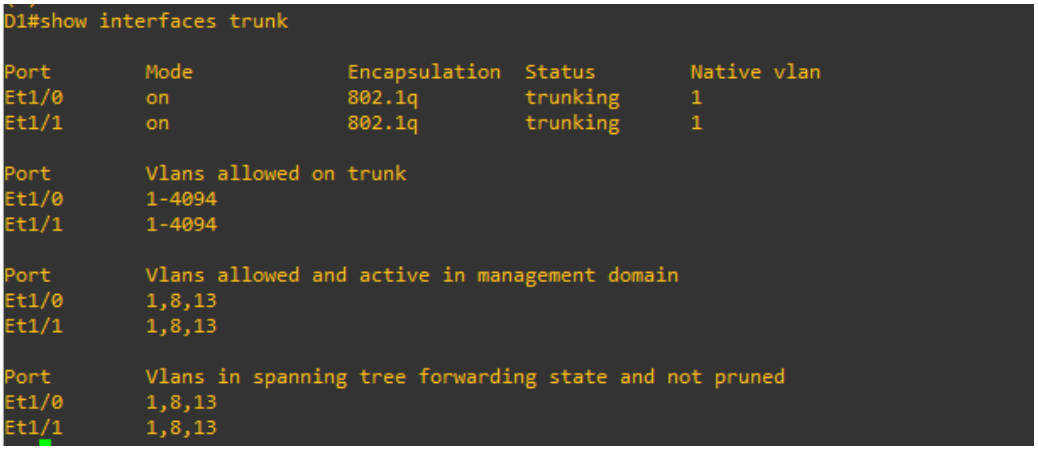
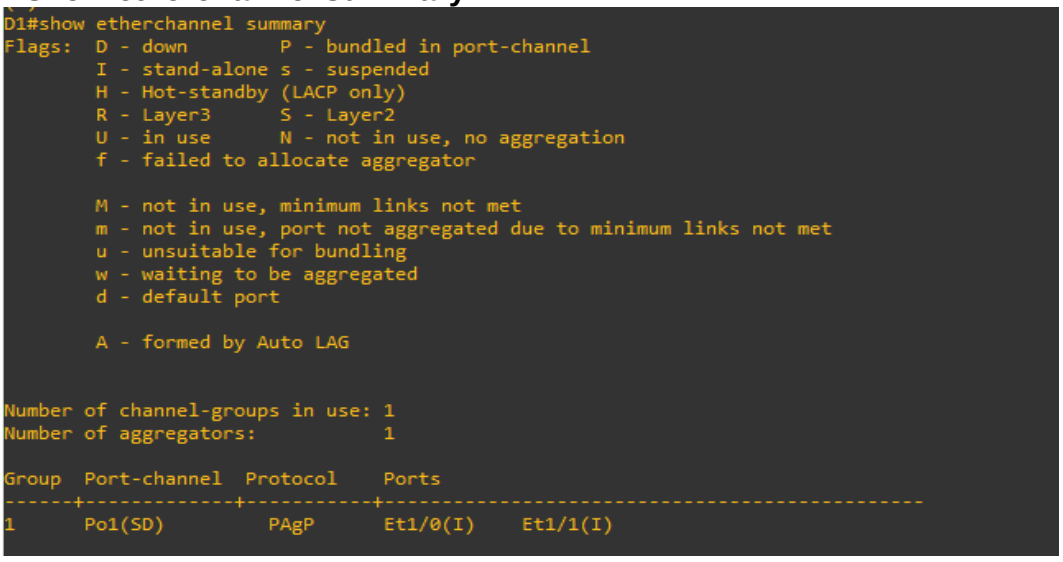


Figure 32 show etherchannel summary



Parte 4. Configure Security

En esta parte debe configurar varios mecanismos de seguridad en los dispositivos de la topología. Las tareas de configuración son las siguientes:

Task#	Task	Specification
4.1	On all devices, secure privileged EXE mode.	Configure an enable secret as follows: • Algorithm type: **SCRYPT** • Password: **nombreestudianteXYZ**.
4.2	On all devices, create a local user account.	Configure a local user: • Name: **admin** • Privilege level: **15** • Algorithm type: **SCRYPT** • Password: **nombrestudianteXYZ**.
4.3	On all devices, enable AAA and enable AAA authentication.	Enable AAA authentication using the local database on all lines.

Table 8.4.1 On all devices secure privileged EXE mode.

R1	R1#conf t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#service password-encryption R1(config)#enable secret fernandoforero537 R1(config)#exit
R2	R2#conf t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#service password-encryption R2(config)#enable secret fernandoforero537 R2(config)#exit
R3	R3#conf t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#service password-encryption

	R3(config)#enable secret fernandoforero537 R3(config)#exit
D1	D1#conf t Enter configuration commands, one per line. End with CNTL/Z. D1(config)#service password-encryption D1(config)#enable secret fernandoforero537 D1(config)#exit
D2	D2#conf t Enter configuration commands, one per line. End with CNTL/Z. D2(config)#service password-encryption D2(config)#enable secret fernandoforero537 D2(config)#exit
A1	A1#conf t Enter configuration commands, one per line. End with CNTL/Z. A1(config)#service password-encryption A1(config)#enable secret fernandoforero537 A1(config)#exit

Table 8.4.2 On all devices, create a local user account.

R1	R1#conf t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#username admin secret fernandoforero537 R1(config)#username admin privilege 15 secret fernandoforero537 R1(config)#exit
R2	R2#conf t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#username admin secret fernandoforero537 R2(config)#username admin privilege 15 secret fernandoforero537 R2(config)#exit
R3	R3#conf t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#username admin secret fernandoforero537 R3(config)#username admin privilege 15 secret fernandoforero537 R3(config)#exit
D1	D1(config)# *May 11 03:50:05.252: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet0/0 (13), with A1 Ethernet0/0 (8). D1(config)#username admin secret fernandoforero537 D1(config)#username admin privilege 15 secret fernandoforero537 D1(config)#exit
D2	D2#conf t Enter configuration commands, one per line. End with CNTL/Z.

	D2(config)#username admin secret fernandoforero537 D2(config)#username admin privilege 15 secret fernandoforero537 D2(config)#exit
A1	A1#conf t Enter configuration commands, one per line. End with CNTL/Z. A1(config)#username admin secret fernandoforero537 A1(config)#username admin privilege 15 secret fernandoforero537 A1(config)#exit

Table 8. 4.3. On all devices, enable AAA and enable AAA authentication.

R1	R1#conf t Enter configuration commands, one per line. End with CNTL/Z. R1(config)#aaa new-model R1(config)#aaa authentication login default local R1(config)#exit
R2	R2#conf t Enter configuration commands, one per line. End with CNTL/Z. R2(config)#aaa new-model R2(config)#aaa authentication login default local R2(config)#exit
R3	R3#conf t Enter configuration commands, one per line. End with CNTL/Z. R3(config)#aaa new-model R3(config)#aaa authentication login default local R3(config)#exit

D1	D1#conf t Enter configuration commands, one per line. End with CNTL/Z. D1(config)#aaa new-model D1(config)#aaa authentication login default local D1(config)#exit
D2	D2#conf t Enter configuration commands, one per line. End with CNTL/Z. D2(config)#aaa new-model D2(config)#aaa authentication login default local D2(config)#exit
A1	A1#conf t Enter configuration commands, one per line. End with CNTL/Z. A1(config)#aaa new-model A1(config)#aaa authentication login default local A1(config)#exit

Figure 33.show run | include aaa|username R1

```
R1#show run | include aaa|username
aaa new-model
aaa authentication login default local
aaa session-id common
username admin privilege 15 secret 5 $1$M6n1$aaHAk1YbElBj2W7qNONf8.
```

Figure 34. show run | include aaa|username R2

```
R2#show run | include aaa|username
aaa new-model
aaa authentication login default local
aaa session-id common
username admin privilege 15 secret 5 $1$F3Se$la3WHlg7dotJTBDCbp1q7.
R2#
```

Figure 35. show run | include aaa|username R3

```
R3#show run | include aaa|username
aaa new-model
aaa authentication login default local
aaa session-id common
username admin privilege 15 secret 5 $1$Z3YP$.8CdvZTC84msb2pewLgzq.
R3#
```

Figure 36 show run | include aaa|username D1

```
D1#show run | include aaa|username
username admin privilege 15 secret 5 $1$EV20$7MawgvzDH4pfEvIdAWDAP0
aaa new-model
aaa authentication login default local
aaa session-id common
```

Figure 37 show run | include aaa|username D2

```
D2#show run | include aaa|username
username admin privilege 15 secret 5 $1$Ofu8$fhUJXmiNJ1kuG5tl517cv/
aaa new-model
aaa authentication login default local
aaa session-id common
```

Figure 38 show run | include aaa|username A1

```
A1#show run | include aaa|username
username admin privilege 15 secret 5 $1$sgap$BtlLXkvwaTLha2a.3DRzr0
aaa new-model
aaa authentication login default local
aaa session-id common
```

CONCLUSIONES

En este avance de la actividad se logra demostrar la importancia de construir una red con los parámetros adecuados en cuanto a topología, jerarquía y protocolos de enrutamiento, ya que con estos elementos se puede obtener una red que funcione de manera adecuada para que los usuarios de esta solo accedan a lo que se les permite por medio del protocolo de direccionamiento configurado en los dispositivos.

Construir una red empresarial como se pudo notar en el desarrollo de la actividad es un trabajo que requiere de varios conocimientos en cuanto a la configuración de los dispositivos ya que para poder trabajarla se deben invertir recursos importantes en cuanto a Hardware y Software al igual que saber configurar las Vlan que son las que dependiendo de su configuración y encapsulación va permitir o no un tráfico en la red.

Por medio de la configuración Vrf se puede lograr que un dispositivo (Router) pueda ser dinámico en sus enrutamientos, ya que puede ejecutarlos de manera simultánea sin afectar ningún direccionamiento al generarle tablas de enrutamiento independientes.

Importante la práctica de todo este tipo de trabajos ya que de esto se adquiere la práctica para poder identificar errores en la configuración ya que en este avance al ejecutar el ping solicitados no se logró, aunque se realizó varias modificaciones y validación de errores mostrando las configuraciones correctas.

Durante el desarrollo de esta actividad se puede demostrar la importancia no solo de tener una red dinámica donde los usuarios puedan tener acceso a ella sin notar fallas en alguno de los enlaces sino también de aplicar protocolos de seguridad, pues así como la tecnología avanza las redes se hacen vulnerables a ataques que impidan el funcionamiento de la misma o de la pérdida de información cuando la red falla, por lo que se establecen protocolos de seguridad para la autenticación de usuarios como la alternativa de que con los mismos Routers se puedan operar varios enlaces, dando confiabilidad al usuario de la red que usa.

Se resalta la importancia de tener la pericia y la práctica en la configuración de dispositivos y sus protocolos, en este documento se observa la configuración como se solicita, pero no se logra la comunicación al 100% de los dispositivos, esto se minimiza o se erradica con la práctica en los enrutamientos para poder identificar las fallas de dichas configuraciones en una dirección o un comando mal ejecutado.

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