

DIPLOMADO DE PROFUNDIZACION CISCO PRUEBA DE HABILIDADES PRÁCTICAS

CCNP

EDWIN SEBASTIAN ROJAS CARDENAS

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD ESCUELA DE

CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI

INGENIERÍA ELECTRONICA

BOGOTA

2022

DIPLOMADO DE PROFUNDIZACION CISCO PRUEBA DE HABILIDADES PRÁCTICAS

CCNP

EDWIN SEBASTIAN ROJAS CARDENAS

DIRECTOR:

JUAN ESTEBAN TAPIAS BAENA

DIPLOMADO DE OPCIÓN DE GRADO PRESENTADO
PARA OPTAR EL TÍTULO DE INGENIERO ELECTRONICO

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD ESCUELA DE

CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI

INGENIERÍA ELECTRONICA

BOGOTA

2022

Nota de aceptación

Firma del Presidente del Jurado

Firma del Jurado

Firma del Jurado

Bogota D.C, 27 de noviembre de 2022

DEDICATORIA

Este Diplomado va dedicado a todas las personas que aportaron a mi conocimiento los cuales estuvieron presentes para el desarrollo de este diplomado, en especial a la Universidad Nacional Abierta y A distancia y a su carrera de Ingeniería Electrónica junto con sus docentes los cuales durante este tiempo me dieron las herramientas y bases principales para el desarrollo de mi carrera.

AGRADECIMIENTOS

El presente trabajo fue realizado bajo la supervisión del Ing. John Harold Pérez Calderón a quién quiero agradecer por su dedicación y solución a las diferentes inquietudes que tuve al realizar el trabajo, además de agradecer su comprensión y tiempo para que se desarrollara de manera exitosa.

Quiero agradecerle a mi familia la cual estuvo en todo este proceso de formación académica, a Dios por darme la fortaleza y guiarme en el camino. A la universidad y los tutores por abrirme las puertas y brindarme las herramientas fundamentales para mi proceso de formación profesional.

CONTENIDO

DEDICATORIA	4
AGRADECIMIENTOS	5
LISTA DE TABLAS	7
LISTA DE FIGURAS	8
GLOSARIO	9
RESUMEN	10
INTRODUCCIÓN	11
CONTENIDO	12
ENCOR SKILLS ASSESSMENT (SCENARIO 1)	12
1.PARTE 1.....	15
2. PARTE 2.....	31
ENCOR SKILLS ASSESSMENT (SCENARIO 2)	44
3.PARTE 1.....	44
4.PARTE 2.....	54
CONCLUSIONES	62
BIBLIOGRAFÍA.....	63

LISTA DE TABLAS

	Pag.
Tabla 1. Tabla de Direccionamientos equipos.....	13

LISTA DE FIGURAS

	Pag.
Figura1. Escenario 1.....	12
Figura 2. Montaje del escenario propuesto.....	15
Figura 3. Configuración PC.....	29
Figura 4. Verificación de DHCP.....	39
Figura 5. Verificación de conexión PC1.....	41
Figura 6. Verificación de conexión PC2 Y PC3.....	42
Figura 7. Verificación de conexión PC4.....	43
Figura 8. Verificación de la tabla de ruta IPV4.....	52
Figura 9. Verificación the loopback 0.....	53
Figura 10. Verificación del slas.....	60
Figura 11. Verificación del standby.....	61

GLOSARIO

ASN: Autonomous System Number, se le denomina al grupo de red que es gestionado por algún operador de red por ruteo externo.

BGP: Border Gateway Protocol, utilizado para conectar distintos sistemas autónomos principalmente con el canal de internet.

DHCP: Dynamic Host Configuration Protocol, funciona en el modelo cliente/servidor y proporciona automáticamente direcciones IP y otra información relacionada como la máscara y el Gateway.

HSRP: (Hot Standby Router Protocol) protocolo propiedad de CISCO que permite el despliegue de enrutadores redundantes tolerantes de fallos en una red. Este protocolo evita la existencia de puntos de fallo únicos (single point of failure) en la red mediante técnicas de redundancia y comprobación del estado de los routers.

GRE: (Generic Routing Encapsulation) protocolo para el establecimiento de túneles a través de Internet. Está definido en la RFC 1701 y en la RFC 1702, pudiendo transportar hasta 20 protocolos del nivel de red (nivel 3 del modelo OSI) distintos

RESUMEN

Este trabajo consta en desarrollar un escenario propuesto en el cual se debe analizar y dar una solución por medio de los conocimientos adquiridos en el Diplomado de profundización de Cisco CCNP, Detallando cada una de las configuraciones y protocolos de enrutamiento para cada equipo. Con el desarrollo de este trabajo se busca que el estudiante desarrolle destrezas en diferentes campos de la Electrónica y de la Comunicación de redes.

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

ABSTRACT

This work consists of developing a proposed scenario in which a solution must be analyzed and given through the knowledge acquired in the Cisco CCNP Deepening Diploma, detailing each of the configurations and routing protocols for each team. With the development of this work, the student seeks to develop skills in different fields of Electronics and Network Communication.

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

INTRODUCCIÓN

Este trabajo se realizó con el objetivo de dar solución a la actividad correspondiente al curso Diplomado Avanzado CCNP. Con esto se pretende identificar y evaluar el nivel de desarrollo, competencias y habilidades adquiridas durante el curso, las cuales son obligatorias. Dar una comprensión y resolución de problemas relacionados con diversos aspectos de las redes, aprender los protocolos de enrutamiento, implemente soluciones compatibles con el enrutamiento en un nivel más avanzado, configurando sistemas de red, VLAN, analizando la administración y la seguridad en redes conmutadas.

Se proponen escenarios en los que cada tarea asignada se realiza con la configuración requerida, cada proceso y configuración también debe ser soportado por los dispositivos en cada etapa, y se documentan las acciones más relevantes para el escenario. El proceso se registra utilizando los comandos Ping, Traceroute, Show IP Route y una de las herramientas de simulación GNS3. Finalmente, con base en lo anterior, se consolida el informe final como prueba del proceso realizado

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

CONTENIDO

ENCOR SKILLS ASSESSMENT (SCENARIO 1)

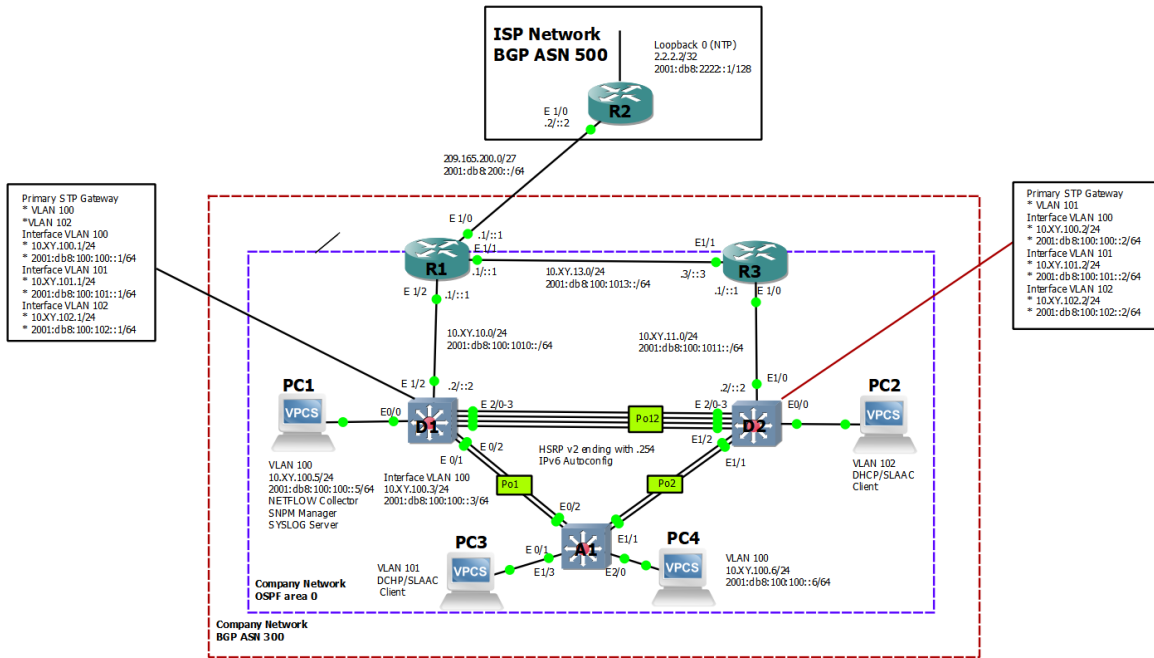


Figura1. Escenario 1

Tabla de Direcccionamiento

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local
R1	E1/0	209.165.200.225/27	2001:db8:200::1/64	fe80::1:1
	E2/0	10.56.10.1/24	2001:db8:100:1010::1/64	fe80::1:2
	E0/0	10.56.13.1/24	2001:db8:100:1013::1/64	fe80::1:3
R2	E1/0	209.165.200.226/27	2001:db8:200::2/64	fe80::2:1
	Loopback0	2.2.2.2/32	2001:db8:2222::1/128	fe80::2:3
R3	E1/0	10.56.11.1/24	2001:db8:100:1011::1/64	fe80::3:2
	E1/1	10.56.13.3/24	2001:db8:100:1013::3/64	fe80::3:3
D1	E1/2	10.56.10.2/24	2001:db8:100:1010::2/64	fe80::d1:1
	VLAN 100	10.56.100.1/24	2001:db8:100:100::1/64	fe80::d1:2
	VLAN 101	10.56.101.1/24	2001:db8:100:101::1/64	fe80::d1:3
	VLAN 102	10.56.102.1/24	2001:db8:100:102::1/64	fe80::d1:4
D2	E1/0	10.56.11.2/24	2001:db8:100:1011::2/64	fe80::d2:1
	VLAN 100	10.56.100.2/24	2001:db8:100:100::2/64	fe80::d2:2
	VLAN 101	10.56.101.2/24	2001:db8:100:101::2/64	fe80::d2:3
	VLAN 102	10.56.102.2/24	2001:db8:100:102::2/64	fe80::d2:4
A1	VLAN 100	10.56.100.3/23	2001:db8:100:100::3/64	fe80::a1:1
PC1	NIC	10.56.100.5/24	2001:db8:100:100::5/64	EUI-64
PC2	NIC	DHCP	SLAAC	EUI-64

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local
PC3	NIC	DHCP	SLAAC	EUI-64
PC4	NIC	10.56.100.6/24	2001:db8:100:100::6/64	EUI-64

Tabla 1. Tabla de Direccionamientos equipos

1.PARTE 1

Construir la red y configurar los ajustes básicos del dispositivo y el direccionamiento de la interfaz

Paso 1: Cablear la red como se muestra en la topología.

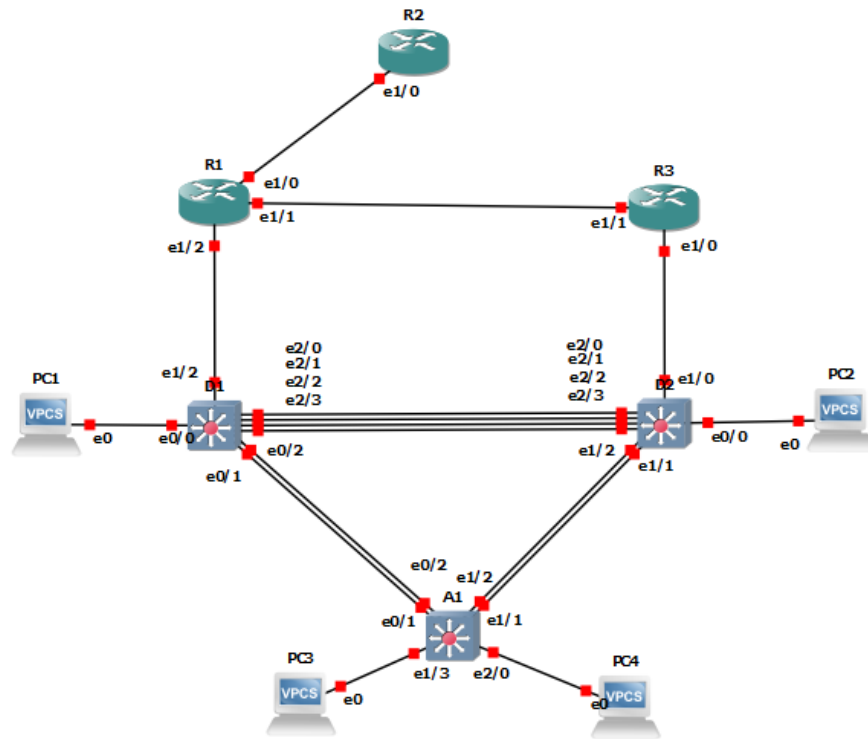


Figura 2. Montaje del escenario propuesto.

Paso 2: Configure los ajustes básicos para cada dispositivo

Se configuran los parámetros básicos del dispositivo tales como nombre, texto de banner motd para cada grupo, especialmente dirección IP, para cada interfaz IPV4 e IPV6 en cada enrutador. El conmutador tiene un nombre, una dirección IP y se crea un grupo DHCP con cada exención

Router R1

```
hostname R1
```

```
ipv6 unicast-routing
```

```
no ip domain lookup
```

```
banner motd # R1, ENCOR Skills Assessment#
```

```
line con 0
```

```
exec-timeout 0 0
```

```
logging synchronous
```

```
exit
```

```
interface e1/0
```

```
ip address 209.165.200.225 255.255.255.224
```

```
ipv6 address fe80::1:1 link-local
```

```
ipv6 address 2001:db8:200::1/64
```


no shutdown

exit

interface e1/2

ip address 10.XY.10.1 255.255.255.0

ipv6 address fe80::1:2 link-local

ipv6 address 2001:db8:100:1010::1/64

no shutdown

exit

interface e1/1

ip address 10.XY.13.1 255.255.255.0

ipv6 address fe80::1:3 link-local

ipv6 address 2001:db8:100:1013::1/64

no shutdown

exit

Router R2

```
hostname R2
```

```
ipv6 unicast-routing
```

```
no ip domain lookup
```

```
banner motd # R2, ENCOR Skills Assessment#
```

```
line con 0
```

```
exec-timeout 0 0
```

```
logging synchronous
```

```
exit
```

```
interface e1/0
```

```
ip address 209.165.200.226 255.255.255.224
```

```
ipv6 address fe80::2:1 link-local
```

```
ipv6 address 2001:db8:200::2/64
```

```
no shutdown
```

```
exit
```

```
interface Loopback 0
```

```
ip address 2.2.2.2 255.255.255.255
```

```
ipv6 address fe80::2:3 link-local
```

```
ipv6 address 2001:db8:2222::1/128
```

```
no shutdown
```

```
exit
```

```
Router R3
```

```
hostname R3
```

```
ipv6 unicast-routing
```

```
no ip domain lookup
```

```
banner motd # R3, ENCOR Skills Assessment#
```

```
line con 0
```

```
exec-timeout 0 0
```

```
logging synchronous
```

```
exit
```

```
interface e1/0
```

```
ip address 10.XY.11.1 255.255.255.0
```

```
ipv6 address fe80::3:2 link-local
```

ipv6 address 2001:db8:100:1011::1/64

no shutdown

exit

interface e1/1

ip address 10.XY.13.3 255.255.255.0

ipv6 address fe80::3:3 link-local

ipv6 address 2001:db8:100:1010::2/64

no shutdown

exit

Switch D1

hostname D1

ip routing

ipv6 unicast-routing

no ip domain lookup

banner motd # D1, ENCOR Skills Assessment#

line con 0

exec-timeout 0 0

logging synchronous

exit

vlan 100

name Management

exit

vlan 101

name UserGroupA

exit

vlan 102

name UserGroupB

exit

vlan 999

name NATIVE

exit

interface e1/2

no switchport

```
ip address 10.XY.10.2 255.255.255.0
```

```
ipv6 address fe80::d1:1 link-local
```

```
ipv6 address 2001:db8:100:1010::2/64
```

```
no shutdown
```

```
exit
```

```
interface vlan 100
```

```
ip address 10.XY.100.1 255.255.255.0
```

```
ipv6 address fe80::d1:2 link-local
```

```
ipv6 address 2001:db8:100:100::1/64
```

```
no shutdown
```

```
exit
```

```
interface vlan 101
```

```
ip address 10.XY.101.1 255.255.255.0
```

```
ipv6 address fe80::d1:3 link-local
```

```
ipv6 address 2001:db8:100:101::1/64
```

```
no shutdown
```

```
exit
```

```
interface vlan 102

ip address 10.XY.102.1 255.255.255.0

ipv6 address fe80::d1:4 link-local

ipv6 address 2001:db8:100:102::1/64

no shutdown

exit

ip dhcp excluded-address 10.XY.101.1 10.XY.101.109

ip dhcp excluded-address 10.XY.101.141 10.XY.101.254

ip dhcp excluded-address 10.XY.102.1 10.XY.102.109

ip dhcp excluded-address 10.XY.102.141 10.XY.102.254

ip dhcp pool VLAN-101

network 10.XY.101.0 255.255.255.0

default-router 10.XY.101.254

exit

ip dhcp pool VLAN-102

network 10.XY.102.0 255.255.255.0

default-router 10.XY.102.254
```

exit

interface range e0/0-3,e1/0-1,e1/3,e2/0-3,e3/0-3

shutdown

exit

Switch D2

hostname D2

ip routing

ipv6 unicast-routing

no ip domain lookup

banner motd # D2, ENCOR Skills Assessment#

line con 0

exec-timeout 0 0

logging synchronous

exit

vlan 100

name Management

exit

vlan 101

name UserGroupA

exit

vlan 102

name UserGroupB

exit

vlan 999

name NATIVE

exit

interface e1/0

no switchport

ip address 10.XY.11.2 255.255.255.0

ipv6 address fe80::d1:1 link-local

ipv6 address 2001:db8:100:1011::2/64

no shutdown

exit

interface vlan 100

ip address 10.XY.100.2 255.255.255.0

ipv6 address fe80::d2:2 link-local

ipv6 address 2001:db8:100:100::2/64

no shutdown

exit

interface vlan 101

ip address 10.XY.101.2 255.255.255.0

ipv6 address fe80::d2:3 link-local

ipv6 address 2001:db8:100:101::2/64

no shutdown

exit

interface vlan 102

ip address 10.XY.102.2 255.255.255.0

ipv6 address fe80::d2:4 link-local

```
ipv6 address 2001:db8:100:102::2/64
```

```
no shutdown
```

```
exit
```

```
ip dhcp excluded-address 10.XY.101.1 10.XY.101.209
```

```
ip dhcp excluded-address 10.XY.101.241 10.XY.101.254
```

```
ip dhcp excluded-address 10.XY.102.1 10.XY.102.209
```

```
ip dhcp excluded-address 10.XY.102.241 10.XY.102.254
```

```
ip dhcp pool VLAN-101
```

```
network 10.XY.101.0 255.255.255.0
```

```
default-router XY.0.101.254
```

```
exit
```

```
ip dhcp pool VLAN-102
```

```
network 10.XY.102.0 255.255.255.0
```

```
default-router 10.XY.102.254
```

```
exit
```

```
interface range e0/0-3,e1/1-3,e2/0-3,e3/0-3
```

```
shutdown
```

exit

Switch A1

hostname A1

no ip domain lookup

banner motd # A1, ENCOR Skills Assessment#

line con 0

exec-timeout 0 0

logging synchronous

exit

vlan 100

name Management

exit

vlan 101

name UserGroupA

exit

vlan 102

name UserGroupB

```
exit

vlan 999

name NATIVE

exit

interface vlan 100

ip address 10.XY.100.3 255.255.255.0

ipv6 address fe80::a1:1 link-local

ipv6 address 2001:db8:100:100::3/64

no shutdown

exit

interface range e0/0,e0/3,e1/0,e2/1-3,e3/0-3

shutdown
```

B. Guarde la configuración en ejecución en startup-config en todos los dispositivos.

C. Configure el direccionamiento de host de PC 1 y PC 4 como se muestra en la tabla de direccionamiento. Asigne una dirección de puerta de enlace predeterminada de 10.56.100.254, que será la dirección IP virtual de HSRP utilizada en la Parte 4.

```
PC1> sh
NAME      IP/MASK      GATEWAY      MAC      LPORT  RHOST:PORT
PC1      10.56.100.5/24      10.56.100.254      00:50:79:66:68:00      10004      127.0.0.1:10005
fe80::250:79ff:fe66:6800/64

PC1> █
```

```
Checking for duplicate address...
PC1 : 10.56.100.6 255.255.255.0 gateway 10.56.100.254
```

```
PC4> sh
NAME      IP/MASK      GATEWAY      MAC      LPORT  RHOST:PORT
PC4      10.56.100.6/24      10.56.100.254      00:50:79:66:68:03      10004      127.0.0.1:10005
fe80::250:79ff:fe66:6803/64
```

Figura3. Configuración PC.

2. PARTE 2

Configurar la red de capa 2 y la compatibilidad con el host.

En esta parte de la evaluación de habilidades, completará la configuración de la red de capa 2 y configurará el soporte de host básico. Al final de esta parte, todos los interruptores deberían poder comunicarse. PC2 y PC3 deben recibir direccionamiento de DHCP y SLAAC.

2.1 En todos los conmutadores, configure las interfaces troncales IEEE 802.1Q en los enlaces de conmutador de interconexión // Habilite enlaces troncales 802.1Q entre:

- **D1 y D2**
- **D1 y A1**
- **D2 y A1**

Switch D1

```
interface range e2/0-3, e0/1-2 //configuración de un grupo de interfaces
```

```
switchport trunk encapsulation dot1q //establece la encapsulación en el  
estándar IEEE 802.1Q
```

```
switchport mode trunk//Configuración de la interfaz truncal
```

exit

Switch D2

interface range e2/0-3, e1/1-2 // Especifica los rangos de las interfaces

switchport trunk encapsulation dot1q // coloca la interfaz en modo de enlace troncal permanente y negocia para convertir el enlace en un enlace troncal

switchport mode trunk

exit

Switch A1

interface range e0/1-2, e1/1-2

switchport trunk encapsulation dot1q

switchport mode trunk

exit

2.2 En todos los conmutadores, cambie la VLAN nativa en los enlaces troncales.

Switch D1

interface range e2/0-3, e0/1-2 //configuración de un grupo de interfaces

switchport trunk native vlan 999 // Se añade las Vlan en un enlace troncal

exit

Switch D2

```
interface range e2/0-3, e1/1-2
```

```
switchport trunk native vlan 999
```

```
exit
```

Switch A1

```
interface range e0/1-2, e1/2
```

```
switchport trunk native vlan 999
```

```
exit
```

2.3 En todos los conmutadores, cambie la VLAN nativa en los enlaces troncales. Use Rapid Spanning Tree.

Switch D1

```
spanning-tree mode rapid-pvst // Se ingresa al modo de configuracion de una interfaz en  
especifico
```

```
exit
```

Switch D2

```
spanning-tree mode rapid-pvst
```

```
exit
```

Switch A1

```
spanning-tree mode rapid-pvst
```

```
exit
```

2.4 En D1 y D2, configure los puentes raíz RSTP apropiados según la información del diagrama de topología. D1 y D2 deben proporcionar respaldo en caso de falla del puente raíz.

Switch D1

```
spanning-tree vlan 100 root primary // se establece la prioridad para el switch
```

```
spanning-tree vlan 102 root primary
```

```
spanning-tree vlan 101 root secondary
```

Switch D2

```
spanning-tree vlan 101 root primary
```

```
spanning-tree vlan 100 root secondary
```

```
spanning-tree vlan 102 root secondary
```

2.5 En todos los switches, cree LACP EtherChannels como se muestra en el diagrama de topología.

Switch D1

```
interface range e2/0-3
```

```
channel-protocol lacp
```

```
channel-group 12 mode active
```

```
exit
```

```
interface port-channel 12
```

```
switchport trunk encapsulation dot1q
```

```
switchport mode trunk
```

```
switchport trunk native vlan 999
```

```
switchport trunk allowed vlan 100-102
```

```
exit
```

```
interface range e0/1-2
```

```
channel-protocol lacp
```

```
channel-group 1 mode active
```

```
exit
```

```
interfac port-channel 1
```

switchport trunk encapsulation dot1q

switchport mode trunk

switchport trunk native vlan 999

switchport trunk allowed vlan 100-102

exit

Switch D2

interface range e2/0-3

channel-protocol lacp

channel-group 12 mode active

exit

interface port-channel 12

switchport trunk encapsulation dot1q

switchport mode trunk

switchport trunk native vlan 999

switchport trunk allowed vlan 100-102

exit

interface range e1/1-2

channel-protocol lacp

channel-group 2 mode active

exit

interface port-channel 2

switchport trunk encapsulation dot1q

switchport mode trunk

switchport trunk native vlan 999

switchport trunk allowed vlan 100-102

exit

Switch A1

interface range e0/1-2

channel-protocol lacp

channel-group 1 mode passive

exit

interface port-channel 1

switchport trunk native vlan 999

switchport trunk allowed vlan 100-102

```
switchport mode trunk
```

```
exit
```

```
interface range e1/1-2
```

```
channel-protocol lacp
```

```
channel-group 2 mode passive
```

```
exit
```

```
interface port-channel 2
```

```
switchport mode trunk
```

```
switchport trunk native vlan 999
```

```
switchport trunk allowed vlan 100-102
```

```
exit
```

2.6 En todos los conmutadores, configure los puertos de acceso de host que se conectan a PC1, PC2, PC3 y PC4.

Switch D1

```
interface e0/0 // ingreso a la interface
```

```
switchport mode access //Establecer el Puerto en modo acceso
```

```
switchport access vlan 100 // Asigne el Puerto a una VLAN
```

Switch D2

```
interface e0/0
```

```
switchport mode access
```

```
switchport access vlan 102
```

Switch A1

```
interface e1/3
```

```
switchport mode access
```

```
switchport access vlan 101
```

```
exit
```

```
interface e2/0
```

```
switchport mode access
```

```
switchport access vlan 100
```

```
exit
```

2.7 Verifique los servicios DHCP IPv4. PC2 y PC3 son clientes DHCP y deberían recibir direcciones IPv4 válidas

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip dhcp
DDORA IP 10.56.102.110/24 GW 10.56.102.254
PC2> █
```

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC3> ip dhcp
DDORA IP 10.56.101.210/24 GW 56.0.101.254
PC3> █
```

Figura 4. Verificación de DHCP PC2 Y PC3

2.8 Verifique la conexión local LAN

PC1 realizar ping a:

- D1: 10.56.100.1
- D2: 10.56.100.2
- PC4: 10.56.100.6

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

Checking for duplicate address...
PC1 : 10.56.100.5 255.255.255.0 gateway 10.56.100.254

PC1> ping 10.56.100.1
84 bytes from 10.56.100.1 icmp_seq=1 ttl=255 time=3.193 ms
84 bytes from 10.56.100.1 icmp_seq=2 ttl=255 time=4.884 ms
84 bytes from 10.56.100.1 icmp_seq=3 ttl=255 time=2.044 ms
84 bytes from 10.56.100.1 icmp_seq=4 ttl=255 time=2.119 ms
84 bytes from 10.56.100.1 icmp_seq=5 ttl=255 time=2.874 ms

PC1> ping 10.56.100.2
84 bytes from 10.56.100.2 icmp_seq=1 ttl=255 time=4.228 ms
84 bytes from 10.56.100.2 icmp_seq=2 ttl=255 time=4.223 ms
84 bytes from 10.56.100.2 icmp_seq=3 ttl=255 time=4.604 ms
84 bytes from 10.56.100.2 icmp_seq=4 ttl=255 time=4.914 ms
84 bytes from 10.56.100.2 icmp_seq=5 ttl=255 time=3.824 ms

PC1> ping 10.56.100.6
84 bytes from 10.56.100.6 icmp_seq=1 ttl=64 time=6.632 ms
84 bytes from 10.56.100.6 icmp_seq=2 ttl=64 time=5.852 ms
84 bytes from 10.56.100.6 icmp_seq=3 ttl=64 time=5.686 ms
84 bytes from 10.56.100.6 icmp_seq=4 ttl=64 time=8.235 ms
84 bytes from 10.56.100.6 icmp_seq=5 ttl=64 time=7.393 ms

PC1> █
```

Figura 5. Verificación de conexión PC1

PC2 realizar ping a:

- D1: 10.56.102.1
- D2: 10.56.102.2

```
PC2> ping 10.56.102.1
84 bytes from 10.56.102.1 icmp_seq=1 ttl=255 time=5.322 ms
84 bytes from 10.56.102.1 icmp_seq=2 ttl=255 time=6.053 ms
84 bytes from 10.56.102.1 icmp_seq=3 ttl=255 time=4.219 ms
84 bytes from 10.56.102.1 icmp_seq=4 ttl=255 time=3.921 ms
84 bytes from 10.56.102.1 icmp_seq=5 ttl=255 time=11.499 ms

PC2> ping 10.56.102.2
84 bytes from 10.56.102.2 icmp_seq=1 ttl=255 time=3.662 ms
84 bytes from 10.56.102.2 icmp_seq=2 ttl=255 time=2.782 ms
84 bytes from 10.56.102.2 icmp_seq=3 ttl=255 time=2.275 ms
84 bytes from 10.56.102.2 icmp_seq=4 ttl=255 time=3.021 ms
84 bytes from 10.56.102.2 icmp_seq=5 ttl=255 time=3.728 ms

PC2> █
```

Figura 6. Verificación de conexión PC2

PC3 realizar ping a:

- D1: 10.56.101.1
- D2: 10.56.101.2

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" license.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC3> ip dhcp
DDORA IP 10.56.101.110/24 GW 10.56.101.254

PC3> ping 10.56.101.1
84 bytes from 10.56.101.1 icmp_seq=1 ttl=255 time=5.764 ms
84 bytes from 10.56.101.1 icmp_seq=2 ttl=255 time=5.091 ms
84 bytes from 10.56.101.1 icmp_seq=3 ttl=255 time=5.838 ms
84 bytes from 10.56.101.1 icmp_seq=4 ttl=255 time=5.594 ms
84 bytes from 10.56.101.1 icmp_seq=5 ttl=255 time=5.878 ms

PC3> ping 10.56.101.2
84 bytes from 10.56.101.2 icmp_seq=1 ttl=255 time=3.644 ms
84 bytes from 10.56.101.2 icmp_seq=2 ttl=255 time=4.589 ms
84 bytes from 10.56.101.2 icmp_seq=3 ttl=255 time=4.632 ms
84 bytes from 10.56.101.2 icmp_seq=4 ttl=255 time=10.245 ms
84 bytes from 10.56.101.2 icmp_seq=5 ttl=255 time=3.943 ms
```

Figura 6. Verificación de Conexión PC3

PC4 realizar ping a:

- D1: 10.56.100.1
- D2: 10.56.100.2
- PC1: 10.56.100.5

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD"
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

Checking for duplicate address...
PC1 : 10.56.100.6 255.255.255.0 gateway 10.56.100.254

PC4> ping 10.56.100.1
84 bytes from 10.56.100.1 icmp_seq=1 ttl=255 time=5.913 ms
84 bytes from 10.56.100.1 icmp_seq=2 ttl=255 time=5.026 ms
84 bytes from 10.56.100.1 icmp_seq=3 ttl=255 time=5.450 ms
84 bytes from 10.56.100.1 icmp_seq=4 ttl=255 time=4.947 ms
84 bytes from 10.56.100.1 icmp_seq=5 ttl=255 time=6.031 ms

PC4> ping 10.56.100.2
84 bytes from 10.56.100.2 icmp_seq=1 ttl=255 time=5.929 ms
84 bytes from 10.56.100.2 icmp_seq=2 ttl=255 time=5.422 ms
84 bytes from 10.56.100.2 icmp_seq=3 ttl=255 time=5.094 ms
84 bytes from 10.56.100.2 icmp_seq=4 ttl=255 time=5.410 ms
84 bytes from 10.56.100.2 icmp_seq=5 ttl=255 time=7.027 ms

PC4> ping 10.56.100.5
84 bytes from 10.56.100.5 icmp_seq=1 ttl=64 time=10.297 ms
84 bytes from 10.56.100.5 icmp_seq=2 ttl=64 time=6.138 ms
84 bytes from 10.56.100.5 icmp_seq=3 ttl=64 time=6.844 ms
84 bytes from 10.56.100.5 icmp_seq=4 ttl=64 time=13.531 ms
84 bytes from 10.56.100.5 icmp_seq=5 ttl=64 time=18.771 ms

PC4> █
```

Figura 7. Verificación de Conexión PC4

ENCOR SKILLS ASSESSMENT (SCENARIO 2)

3.PARTE 1.

Configuración de Protocolos de enrutamiento

3.1 En la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv2 de área única en el área 0.

Router 1

```
router ospf 4 // protocolo de direccionamiento de tipo enlace-estado
```

```
router-id 0.0.4.1
```

```
network 10.0.10.0 0.0.0.255 area 0 // Nombre la red con la ip y mascara
```

```
network 10.0.13.0 0.0.0.255 area 0
```

```
default-information originate // El comando de origen de información predeterminada se utiliza para configurar un proceso de enrutamiento BGP para anunciar una ruta predeterminada (red 0.0. 0.0).
```

```
exit
```

Router 3

```
router ospf 4
```

```
router-id 0.0.4.3
```

```
network 10.56.11.0 0.0.0.255 area 0
```

```
network 10.56.13.0 0.0.0.255 area 0
```

Switch D1

```
router ospf 4
```

```
router-id 0.0.4.131
```

```
network 10.56.10.0 0.0.0.255 area 0
```

```
network 10.56.100.0 0.0.0.255 area 0
```

```
network 10.56.101.0 0.0.0.255 area 0
```

```
network 10.56.102.0 0.0.0.255 area 0
```

```
passive-interface default
```

```
no passive-interface e1/2
```

Switch D2

```
router ospf 4
```

```
router-id 0.0.4.132
```

```
network 10.56.11.0 0.0.0.255 area 0
```

```
network 10.56.100.0 0.0.0.255 area 0
```

```
network 10.56.101.0 0.0.0.255 area 0
```

```
network 10.56.102.0 0.0.0.255 area 0
```

```
passive-interface default
```

```
no passive-interface e1/0
```

3.2 En la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv3 clásico de área única en el área 0

Router 1

```
ipv6 router ospf 6
```

```
router-id 0.0.6.1
```

```
default-information originate
```

```
exit
```

```
interface e1/1
```

```
ipv6 ospf 6 area 0
```

```
interface e1/2
```

```
ipv6 ospf 6 area 0
```

```
exit
```

```
ipv6 route ::/0 e1/0
```

```
ipv6 router ospf 6
```

Router R3:

```
ipv6 router ospf 6
```

```
router-id 0.0.6.3
```

```
exit
```

```
interface e1/1
```

```
ipv6 ospf 6 area 0
```

```
interface e1/0
```

```
ipv6 ospf 6 area 0
```

Switch D1

```
ipv6 router ospf 6
```

```
router-id 0.0.6.131
```

```
passive-interface default
```

```
no passive-interface e1/2
```

```
exit
```

```
interface e1/2
```

```
ipv6 ospf 6 area 0
```

```
exit
```

interface vlan 100

ipv6 ospf 6 area 0

interface vlan 101

ipv6 ospf 6 area 0

interface vlan 102

ipv6 ospf 6 area 0

exit

Switch D2:

ipv6 router ospf 6

router-id 0.0.6.132

passive-interface default

no passive-interface e1/0

exit

interface e1/0

ipv6 ospf 6 area 0

interface vlan 100

ipv6 ospf 6 area 0


```
interface vlan 101
```

```
ipv6 ospf 6 area 0
```

```
interface vlan 102
```

```
ipv6 ospf 6 area 0
```

```
exit
```

3.3 En R2 en la "Red ISP", configure MP-BGP.

Router 2

```
ip route 0.0.0.0 0.0.0.0 loopback 0
```

```
ipv6 route ::/0 loopback 0
```

```
router bgp 500
```

```
bgp router-id 2.2.2.2
```

```
neighbor 209.165.200.225 remote-as 300
```

```
neighbor 2001:db8:200::1 remote-as 300
```

```
address-family ipv4 unicast
```

```
neighbor 209.165.200.225 activate
```

```
no neighbor 2001:db8:200::1 activate
```

```
network 2.2.2.2 mask 255.255.255.255
```

```
network 0.0.0.0

exit-address-family

address-family ipv6 unicast

no neighbor 209.165.200.225 activate

neighbor 2001:db8:200::1 activate

network 2001:db8:2222::1/128

network ::/0

exit-address-family
```

3.4 En R1 en la "Red ISP", configure MP-BGP.

Router 1

```
ip route 10.0.0.0 255.0.0.0 null 0

ipv6 route 2001:db8:100::/48 null 0

router bgp 300

bgp router-id 1.1.1.1

neighbor 209.165.200.226 remote-as 500

neighbor 2001:db8:200::2 remote-as 500

address-family ipv4 unicast
```

```
neighbor 209.165.200.226 activate  
  
no neighbor 2001:db8:200::2 activate  
  
network 10.0.0.0 mask 255.0.0.0  
  
exit-address-family  
  
address-family ipv6 unicast  
  
no neighbor 209.165.200.226 activate  
  
neighbor 2001:db8:200::2 activate  
  
network 2001:db8:100::/48  
  
exit-address-family
```

```

R1#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, I - LISP
+ - replicated route, % - next hop override

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

S* 0.0.0.0/0 is directly connected, Ethernet1/0
2.0.0.0/32 is subnetted, 1 subnets
B 2.2.2.2 [20/0] via 209.165.200.226, 00:04:24
O 10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C 10.56.10.0/24 is directly connected, Ethernet1/2
C 10.56.10.1/32 is directly connected, Ethernet1/2
D 10.56.11.0/24 [110/20] via 10.56.13.3, 00:03:38, Ethernet1/1
C 10.56.13.0/24 is directly connected, Ethernet1/1
C 10.56.13.1/32 is directly connected, Ethernet1/1
D 10.56.100.0/24 [110/11] via 10.56.10.2, 00:05:42, Ethernet1/2
D 10.56.101.0/24 [110/11] via 10.56.10.2, 00:05:42, Ethernet1/2
--More--
*Oct 20 00:42:14.715: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/2 (not half duplex), with D1 Ethernet1/2 (half duplex).
--More--
*Oct 20 00:43:05.299: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/2 (not half duplex), with D1 Ethernet1/2 (half duplex).

solarwinds Solar-PuTTY free tool © 2019 SolarWinds Worldwide, LLC. All rights reserved.

R3#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, I - LISP
+ - replicated route, % - next hop override

Gateway of last resort is 10.56.13.1 to network 0.0.0.0

O*E2 0.0.0.0/0 [110/1] via 10.56.13.1, 00:07:01, Ethernet1/1
O 10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
O 10.56.10.0/24 [110/20] via 10.56.13.1, 00:06:45, Ethernet1/1
C 10.56.11.0/24 is directly connected, Ethernet1/0
C 10.56.11.1/32 is directly connected, Ethernet1/0
C 10.56.13.0/24 is directly connected, Ethernet1/1
L 10.56.13.3/32 is directly connected, Ethernet1/1
O 10.56.100.0/24 [110/11] via 10.56.11.2, 00:04:38, Ethernet1/0
O 10.56.101.0/24 [110/11] via 10.56.11.2, 00:04:38, Ethernet1/0
O 10.56.102.0/24 [110/11] via 10.56.11.2, 00:04:38, Ethernet1/0
R3#
*Oct 20 00:44:33.235: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/0 (not half duplex), with D2 Ethernet1/0 (half duplex).
R3#
*Oct 20 00:45:19.027: %CDP-4-DUPLEX_MISMATCH: duplex mismatch discovered on Ethernet1/0 (not half duplex), with D2 Ethernet1/0 (half duplex).

solarwinds Solar-PuTTY free tool © 2019 SolarWinds Worldwide, LLC. All rights reserved.

D2#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2
I - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
ia - IS-IS inter area, * - candidate default, U - per-user static route
o - ODR, P - periodic downloaded static route, H - NHRP, I - LISP
a - application route
+ - replicated route, % - next hop override

Gateway of last resort is 10.56.11.1 to network 0.0.0.0

O*E2 0.0.0.0/0 [110/1] via 10.56.11.1, 00:04:46, Ethernet1/0
O 10.0.0.0/8 is variably subnetted, 10 subnets, 2 masks
O 10.56.10.0/24 [110/30] via 10.56.11.1, 00:04:46, Ethernet1/0
C 10.56.11.0/24 is directly connected, Ethernet1/0
L 10.56.11.2/32 is directly connected, Ethernet1/0
O 10.56.13.0/24 [110/20] via 10.56.11.1, 00:04:46, Ethernet1/0
C 10.56.100.0/24 is directly connected, Vlan100
C 10.56.100.2/32 is directly connected, Vlan100
C 10.56.101.0/24 is directly connected, Vlan101
C 10.56.101.2/32 is directly connected, Vlan101
C 10.56.102.0/24 is directly connected, Vlan102
L 10.56.102.2/32 is directly connected, Vlan102
D2#

```

Figura 8. Verificación de la tabla de ruta ipv4

```
D1#ping 2.2.2.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 31/44/74 ms
D1#ping 2001:db8:2222::1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:2222::1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 28/70/222 ms
D1#
```

```
D2#ping 2.2.2.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.2.2.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 48/74/126 ms
D2#ping 2001:db8:2222::1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:2222::1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 51/87/148 ms
D2#
```

Figura 9. Verificación the loopback 0

4.PARTE 2

Configurar la redundancia del primer salto

4.1 En D1, cree IP SLA que prueben la accesibilidad de la interfaz E1/2 de R1

Switch D1:

```
ip sla 4
```

```
icmp-echo 10.56.10.1 source-ip 10.56.10.2
```

```
frequency 5
```

```
exit
```

```
ip sla schedule 4 start-time now life forever // crear una ruta estática que esté condicionada a la accesibilidad de una dirección IP
```

```
track 4 ip sla 4 reachability
```

```
delay up 10 down 15
```

```
exit
```

```
ip sla 6
```

```
icmp-echo 2001:db8:100:1010::1 source-interface e1/2
```

```
frequency 5
```

```
exit
```

```
ip sla schedule 6 start-time now life forever
```

```
track 6 ip sla 6 reachability
```

```
delay up 10 down 15
```

```
exit
```

4.2 En D2, cree IP SLA que prueben la accesibilidad de la interfaz E1/0 de R3

Switch D2:

```
ip sla 4
```

```
icmp-echo 10.56.11.1 source-interface e1/0
```

```
frequency 5
```

```
exit
```

```
ip sla schedule 4 start-time now life forever
```

```
track 4 ip sla 4 reachability
```

```
delay up 10 down 15
```

```
exit
```

```
ip sla 6
```

```
icmp-echo 2001:db8:100:1011::1 source-interface e1/0
```

```
frequency 5
```

exit

ip sla schedule 6 start-time now life forever

track 6 ip sla 6 reachability

delay up 10 down 15

exit

4.3 En D1, configure HSRPv2

Switch D1:

interface vlan 100

standby version 2

standby 104 ip 10.56.100.254

standby 104 priority 150

standby 104 preempt

standby 104 track 4 decrement 60

standby 106 ipv6 autoconfig

standby 106 priority 150

standby 106 preempt

standby 106 track 6 decrement 60

exit

interface vlan 101

standby version 2

standby 114 ip 10.56.101.254

standby 114 preempt

standby 114 track 4 decrement 60

standby 116 ipv6 autoconfig

standby 116 preempt

standby 116 track 6 decrement 60

exit

interface vlan 102

standby version 2

standby 124 ip 10.56.102.254

standby 124 priority 150

standby 124 preempt

standby 124 track 4 decrement 60

standby 126 ipv6 autoconfig

standby 126 priority 150

standby 126 preempt

standby 126 track 6 decrement 60

Switch D2:

interface vlan 100

standby version 2

standby 104 ip 10.56.100.254

standby 104 preempt

standby 104 track 4 decrement 60

standby 106 ipv6 autoconfig

standby 106 preempt

standby 106 track 6 decrement 60

exit

interface vlan 101

standby version 2

standby 114 ip 10.56.101.254

standby 114 priority 150

standby 114 preempt

standby 114 track 4 decrement 60

standby 116 ipv6 autoconfig

standby 116 priority 150

standby 116 preempt

standby 116 track 6 decrement 60

exit

interface vlan 102

standby version 2

standby 124 ip 10.56.102.254

standby 124 preempt

standby 124 track 4 decrement 60

standby 126 ipv6 autoconfig

standby 126 preempt

standby 126 track 6 decrement 60

exit

```
D1#show run | section ip sl
track 4 ip sla 4 reachability
  delay down 15 up 10
track 6 ip sla 6 reachability
  delay down 15 up 10
ip sla 4
  icmp-echo 10.56.10.1 source-ip 10.56.10.2
  frequency 5
ip sla schedule 4 life forever start-time now
ip sla 6
  icmp-echo 2001:DB8:100:1010::1 source-interface Ethernet1/2
  frequency 5
ip sla schedule 6 life forever start-time now
D1#
```

solarwinds | Solar-PuTTY free tool © 2019 SolarWinds Worldwide, LLC. All rights reserved.

```
D2#show run | section ip sl
track 4 ip sla 4 reachability
  delay down 15 up 10
track 6 ip sla 6 reachability
  delay down 15 up 10
ip sla 4
  icmp-echo 10.56.11.1 source-interface Ethernet1/0
  frequency 5
ip sla schedule 4 life forever start-time now
ip sla 6
  icmp-echo 2001:DB8:100:1011::1 source-interface Ethernet1/0
  frequency 5
ip sla schedule 6 life forever start-time now
D2#
```

solarwinds | Solar-PuTTY free tool © 2019 SolarWinds Worldwide, LLC. All rights reserved.

Figura 10. Verificación del slas

```
D1#show run | section standby
standby version 2
standby 104 ip 10.56.100.254
standby 104 priority 150
standby 104 preempt
standby 104 track 4 decrement 60
standby 106 ipv6 autoconfig
standby 106 priority 150
standby 106 preempt
standby 106 track 6 decrement 60
standby version 2
standby 114 ip 10.56.101.254
standby 114 preempt
standby 114 track 4 decrement 60
standby 116 ipv6 autoconfig
standby 116 preempt
standby 116 track 6 decrement 60
standby version 2
standby 124 ip 10.56.102.254
standby 124 priority 150
standby 124 preempt
standby 124 track 4 decrement 60
standby 126 ipv6 autoconfig
standby 126 priority 150
--More--
```

solarwinds | Solar-PuTTY free tool © 2019 SolarWinds Worldwide, LLC. All rights reserved.

```
D2#show run | section standby
standby version 2
standby 104 ip 10.56.100.254
standby 104 preempt
standby 104 track 4 decrement 60
standby 106 ipv6 autoconfig
standby 106 preempt
standby 106 track 6 decrement 60
standby version 2
standby 114 ip 10.56.101.254
standby 114 priority 150
standby 114 preempt
standby 114 track 4 decrement 60
standby 116 ipv6 autoconfig
standby 116 priority 150
standby 116 preempt
standby 116 track 6 decrement 60
standby version 2
standby 124 ip 10.56.102.254
standby 124 preempt
standby 124 track 4 decrement 60
standby 126 ipv6 autoconfig
standby 126 preempt
standby 126 track 6 decrement 60
--More--
```

Figura 11. Verificación del standby

CONCLUSIONES

Durante el desarrollo de la parte 2 del escenario uno de los puntos donde se me dificultó el tema de la configuración en los Switch debido a que este no me estaba almacenando la configuración y esto no me dejó avanzar en los puntos de la guía, por lo cual a medida que realizaba alguna configuración guardaba todo el parámetro con el código (wr).

Adicional También tuve inconvenientes con la apertura del switchport ya que este no me estaba cambiando, así que inicié nuevamente la configuración desde cero hasta llegar a este paso y verificar después de configurado la apertura de este switchport

BIBLIOGRAFÍA

UNAD (2015). Switch CISCO -Procedimientos de instalación y configuración del IOS [OVA].

<https://1drv.ms/u/s!AmIJYei-NT1IlyYRohwtwPUV64dg>

Edgeworth, B., Garza Rios, B., Gooley, J., Hucaby, D. (2020). CISCO Press (Ed). IP Routing Essentials. CCNP and CCIE Enterprise Core ENCOR 350-401.

<https://1drv.ms/b/s!AAIGg5JUgUBthk8>

Edgeworth, B., Garza Rios, B., Gooley, J., Hucaby, D. (2020). CISCO Press (Ed). EIGRP.

CCNP and CCIE Enterprise Core ENCOR 350-401. <https://1drv.ms/b/s!AAIGg5JUgUBthk8>