

DIPLOMADO DE PROFUNDIZACIÓN CISCO
PRUEBA DE HABILIDADES PRÁCTICA CCNP

NIVER ARTURO CALDERON HERNANDEZ

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA – UNAD
ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA – ECBTI
INGENIERÍA ELECTRONICA
BUCARAMANGA
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DIPLOMADO DE OPCIÓN DE GRADO PRESENTADO PARA OPTAR EL
TÍTULO DE INGENIERO ELECTRONICO

DIRECTOR:
JUAN ESTEBAN TAPIAS BAENA
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NOTA DE ACEPTACIÓN

Firma del Presidente del Jurado

Firma del Jurado

BUCARAMANGA 17 NOVIEMBRE DE 2022

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Doy gracias a DIOS, por su misericordia conmigo, por permitirme llegar hasta esta etapa de ,mi vida donde culminare el proceso de formacion como ingeniero electronico, agradezco a mi madre por su amor y su apoyo y animo incondicional desde siempre, eso me ha ayudado a cumplir mis objetivos trazado, agradezco a mi novia por su amor, apoyo incondicional durante todo este tiempo, y a mi amado perro por su amor y compañía en mi vida, tambien quiero agradecer a todos los tutores de la universidad que sin ellos nada seria posible, ellos son los formadores del profesional que sere.

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GLOSARIO

DUPLEX: dúplex es un término utilizado en telecomunicación para definir a un sistema que es capaz de mantener una comunicación bidireccional, enviando y recibiendo mensajes de forma simultánea.

DHCP: el Protocolo de configuración dinámica de host (DHCP) es un protocolo cliente/servidor que proporciona automáticamente un host de Protocolo de Internet (IP) con su dirección IP y otra información de configuración relacionada, como la máscara de subred y la puerta de enlace predeterminada.

IP: la dirección IP es una etiqueta numérica, por ejemplo "192.0.10.1" que identifica, de manera lógica y jerárquica, a una interfaz en la red de un dispositivo.

TCP/IP: la familia de protocolos de internet es un conjunto de protocolos de red en los que se basa internet y que permiten la transmisión de datos entre computadoras

VLAN: una VLAN, acrónimo de virtual LAN, es un método para crear redes lógicas independientes dentro de una misma red física.

RESUMEN

En diplomado de profundización CCNP CISCO, donde se desarrollaron habilidades dentro del campo de las comunicaciones con la plataforma CISCO, enfocado en dar soluciones a distintas necesidades de comunicación respecto a redes locales y empresariales, donde se tiene el criterio para diseñar topologías de red que cumplan con las condiciones requeridas en la industria, se configuran interfaces, teniendo muy presente que tipo de red, que accesibilidad debe tener con cada tipo de dispositivos. Se realiza distintas configuraciones en dispositivos capa 2 donde se configuran interfaces troncales y puentes raíz, también parametrizamos OSPF con sus redundancias para los saltos de hosts, se usan los simuladores PACKET TRACER y GNS3 con los cuales realizamos las distintas prácticas de los laboratorios planteados durante el desarrollo del diplomado, la ventaja que tiene la herramienta GNS3 es muy útil y robusta la cual nos permitió en los 2 escenarios planteados configuraciones que son muy similares de las que encontraremos en campo real, donde se realizaron configuraciones de routers, switches, donde se ponen en práctica todo lo aprendido y poder validar su buen funcionamiento.

Palabras Clave: CISCO, CCNP, CONMUTACIÓN, ENRUTAMIENTO, REDES, ELECTRÓNICA.

ABSTRACT

Business networks, where there is the criteria to design network topologies to meet With the conditions required in the industry, interfaces are configured, keeping in mind what type of network, what accessibility it must have with each type of device. Different configuration is carried out in layer 2 devices where trunk interfaces and root bridges are configured, we also parameterize OSPF with its redundancies for host hops, the PACKET TRACER and GNS3 simulators are used with which we carry out the different laboratory practices proposed during the development of the diploma, the advantages that the GNS3 tool has is very useful and robust which allowed us in the 2 scenarios proposed configurations are very similar to those we will find in the real field, where router configuration, switches, where they are placed into practice everything learned and be able to validate its proper functioning.

Keywords: CISCO, CCNP, SWITCHING, ROUTING, NETWORKS, ELECTRONICS.

INTRODUCCIÓN

En el trabajo se desarrollo lo propuesto en el escenario 1 y escenario 2, los cuales contenian las tematicas de uso de protocolo STP, configuracion VLANS, donde se compredio las jerarquias de las infraestructura de red, que con las configuraciones desde las basicas y avanzadas se realizo los protocolos de enrutamientos para servicio ip empresariales.

Realizamos configuracion de cada dispositivo, donde se realizar descripcion de cada codigo ingresado para tener una mayor comprension del proceso y cada linea de codigo, realizamos las debidas validacion de conectividad para poder garantizar que lo que se haya programado cumpla con los requisitos establecido en la guia, se implemento la herramienta GNS3 a traves de maquina virtual la cual es una programa bastante robusto y de facil manejo y comprension para poder desarrollar de buena manera la actividad.

Se realiza configuraciones de interfaces troncales, STP, VLANS, RSTP, donde tambien crea LACP EtherChannels de igual manera se realiza configuracion de MP-BGP.

ESCENARIO 1

En esta evaluación de habilidades, usted es responsable de completar la configuración de la red para que haya accesibilidad completa de extremo a extremo, para que los hosts tengan soporte de puerta de enlace predeterminada confiable y para que los protocolos de administración estén operativos dentro de la parte de "Red de la empresa" de la topología. Tenga cuidado de verificar que sus configuraciones cumplan con las especificaciones proporcionadas y que los dispositivos funcionen según lo requerido.

Recursos necesarios:

3 Routers (Cisco 7200).

3 Switches (Cisco IOU L2).

4 PCs (Use the GNS3's VPCS).

Luego de la configuración de los dispositivos en GNS3, se deben configurar los Slots de los adaptadores de red del SW como se muestra en la topología.

Objetivos:

Parte 1: Construir la Red y configurar los ajustes básicos del Dispositivo y el Direcccionamiento de la Interfaz.

Parte 2: Configurar la Red de Capa 2 y la Compatibilidad con el Host.

Parte 3: Configurar Protocolos de Enrutamiento.

Parte 4: Configurar la Redundancia de Primer Salto.

Parte 1: Construir la Red y configurar los ajustes básicos del Dispositivo y el Direcccionamiento de la Interfaz.

En la Parte 1, configurará la topología de la red y configurará los ajustes básicos y el direccionamiento de la interfaz.

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.

Table 1 Tabla de Direcccionamiento

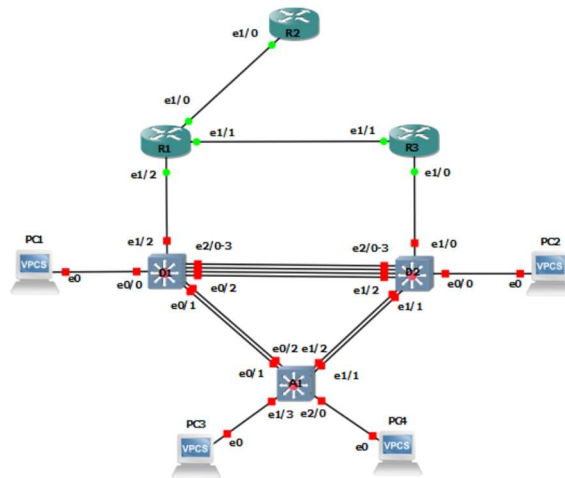
Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local
R1	E1/0	209.165.200.22 5/27	2001:db8:200::1/64	fe80::1:1

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local
	E1/2	10.XY.10.1/24	2001:db8:100:1010::1/64	fe80::1:2
	E1/1	10. XY.13.1/24	2001:db8:100:1013::1/64	fe80::1:3
R2	E1/0	209.165.200.22 6/27	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. XY.11.1/24	2001:db8:100:1011::1/64	fe80::3:2
	E1/1	10. XY.13.3/24	2001:db8:100:1013::3/64	fe80::3:3
D1	E1/2	10. XY.10.2/24	2001:db8:100:1010::2/64	fe80::d1:1
	VLAN 100	10. XY.100.1/24	2001:db8:100:100::1/64	fe80::d1:2
	VLAN 101	10.XY.101.1/24	2001:db8:100:101::1/64	fe80::d1:3
	VLAN 102	10.XY.102.1/24	2001:db8:100:102::1/64	fe80::d1:4
D2	E1/0	10.XY.11.2/24	2001:db8:100:1011::2/64	fe80::d2:1
	VLAN 100	10.XY.100.2/24	2001:db8:100:100::2/64	fe80::d2:2
	VLAN 101	10.XY.101.2/24	2001:db8:100:101::2/64	fe80::d2:3
	VLAN 102	10.XY.102.2/24	2001:db8:100:102::2/64	fe80::d2:4
A1	VLAN 100	10.XY.100.3/23	2001:db8:100:100::3/64	fe80::a1:1
PC1	NIC	10.XY.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.XY.100.6/24	2001:db8:100:100::6/64	EUI-64

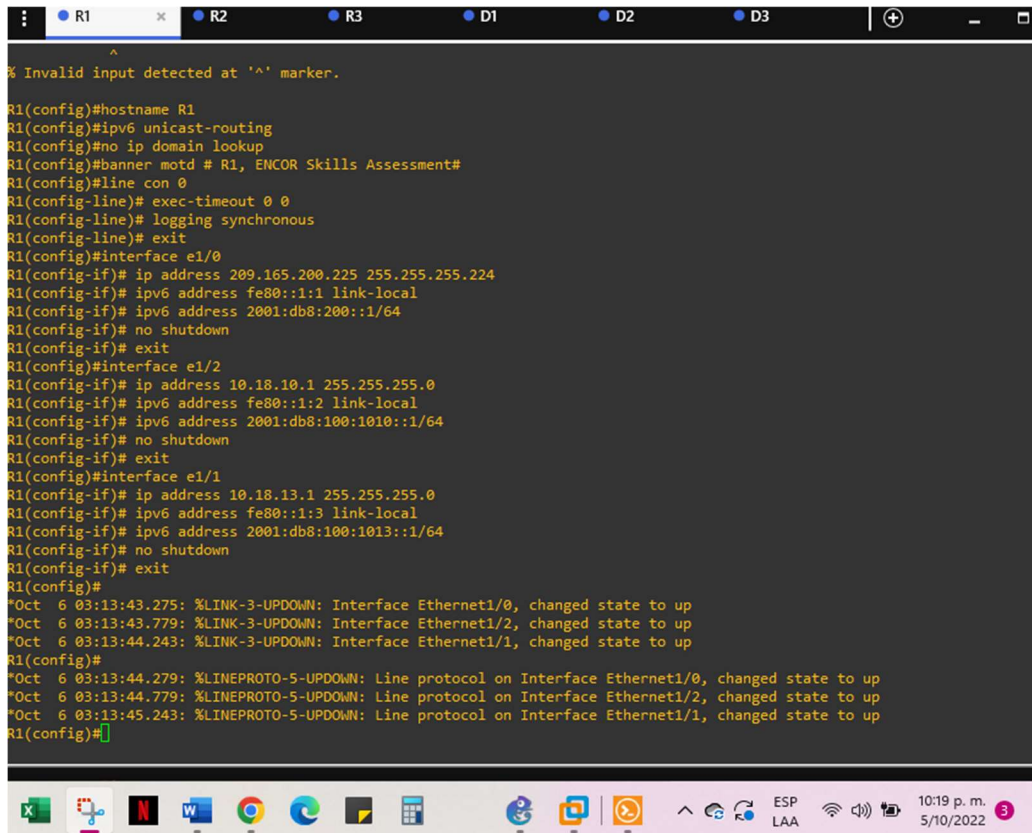
FUENTE 1 Prueba de Habilidades CCNP.

Ilustración 1 GNS3 TOPOLOGIA



FUENTE 2 AUTORIA PROPIA

Ilustración 2 CONFIGURACION R1



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

R1(config)#hostname R1
R1(config)#ipv6 unicast-routing
R1(config)#no ip domain lookup
R1(config)#banner motd # R1, ENCOR Skills Assessment#
R1(config)#line con 0
R1(config-line)# exec-timeout 0 0
R1(config-line)# logging synchronous
R1(config-line)# exit
R1(config)#interface e1/0
R1(config-if)# ip address 209.165.200.225 255.255.255.224
R1(config-if)# ipv6 address fe80::1:1 link-local
R1(config-if)# ipv6 address 2001:db8:200::1/64
R1(config-if)# no shutdown
R1(config-if)# exit
R1(config)#interface e1/2
R1(config-if)# ip address 10.18.10.1 255.255.255.0
R1(config-if)# ipv6 address fe80::1:2 link-local
R1(config-if)# ipv6 address 2001:db8:100:1010::1/64
R1(config-if)# no shutdown
R1(config-if)# exit
R1(config)#interface e1/1
R1(config-if)# ip address 10.18.13.1 255.255.255.0
R1(config-if)# ipv6 address fe80::1:3 link-local
R1(config-if)# ipv6 address 2001:db8:100:1013::1/64
R1(config-if)# no shutdown
R1(config-if)# exit
R1(config)#
*Oct 6 03:13:43.275: %LINK-3-UPDOWN: Interface Ethernet1/0, changed state to up
*Oct 6 03:13:43.779: %LINK-3-UPDOWN: Interface Ethernet1/2, changed state to up
*Oct 6 03:13:44.243: %LINK-3-UPDOWN: Interface Ethernet1/1, changed state to up
R1(config)#
*Oct 6 03:13:44.279: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to up
*Oct 6 03:13:44.779: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up
*Oct 6 03:13:45.243: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to up
R1(config)#
```

FUENTE 3 AUTORIA PROPIA

Paso 1: Configure los ajustes básicos para cada Dispositivo

A. Consola en cada dispositivo, ingrese al modo de configuración global y aplique la configuración básica. Las configuraciones de inicio para cada dispositivo se proporcionan a continuación:

R1:

hostname R1//Asignación nombre router
ipv6 unicast-routing//Configuración del enrutamiento
ipv6 no ip domain lookup // Configuración búsqueda
ip dominio banner motd # R1, ENCOR Skills Assessment# //Mensaje de inicio router
line con 0//Acceso a programación de consola
exec-timeout 0 0// Programación desconexión consola
logging synchronous //Programacion ingreso sincrónico
exit

interface e1/0//Selección interfaz
Ethernet 1/0

```
ip address 209.165.200.225 255.255.255.224//Dirección ip ipv4
ipv6 address fe80::1:1 link-local //Dirección ip link local
exit
```

```
interface e1/2 //Selección interfaz Ethernet 1/2
ip address 10.18.10.1 255.255.255.0//Dirección ip ipv4
ipv6 address fe80::1:2 link-loca //Dirección ip link local
ipv6 address 2001:db8:100:1010::1/64 //Dirección ipv6
no shutdown //Encendido de la interfaz
exit
```

```
interface e1 //Selección interfaz Ethernet 1/1
ip address 10.18.10.1 255.255.255.0 //Dirección ip ipv4
ipv6 address fe80::1:3 link-local//Dirección ip link local
ipv6 address 2001:db8:100:1013::1/64 //Dirección ipv6
no shutdown
exit
```

copy running-config startup-config //Guardar la configuración realizada

Ilustración 3 CONFIGURACION R2

```
R1 R2 R3 D1 D2 D3
*Oct 6 03:12:55.399: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Oct 6 03:12:55.399: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Oct 6 03:12:55.475: %LINK-5-CHANGED: Interface Ethernet1/0, changed state to a
dministratively down
*Oct 6 03:12:55.475: %LINK-5-CHANGED: Interface Ethernet1/1, changed state to a
dministratively down
*Oct 6 03:12:55.479: %LINK-5-CHANGED: Interface Ethernet1/2, changed state to a
dministratively down
*Oct 6 03:12:55.483: %LINK-5-CHANGED: Interface Ethernet1/3, changed state to a
dministratively down
R2#configure terminal
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#
R2(config)#line con 0
R2(config-line)# exec-timeout 0 0
R2(config-line)# logging synchronous
R2(config-line)# exit
R2(config)#interface e1/0
R2(config-if)# ip address 209.165.200.226 255.255.255.224
R2(config-if)# ipv6 address fe80::2:1 link-local
R2(config-if)# ipv6 address 2001:db8:200::2/64
R2(config-if)# no shutdown
R2(config-if)# exit
R2(config)#interface Loopback 0
R2(config-if)# ip address 2.2.2.2 255.255.255.255
R2(config-if)# ipv6 address fe80::2:3 link-local
R2(config-if)# ipv6 address 2001:db8:2222::1/128
R2(config-if)# no shutdown
R2(config-if)# exit
R2(config)#
*Oct 6 03:14:22.347: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
R2(config)#
*Oct 6 03:14:23.155: %LINK-3-UPDOWN: Interface Ethernet1/0, changed state to up
*Oct 6 03:14:24.155: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to up
R2(config)#
```

FUENTE 4 AUTORIA PROPIA

```

R1:
hostname R2 //Asignación nombre router
ipv6 unicast-routing //Configuración del enrutamiento ipv6
no ip domain lookup // Configuración búsqueda ip dominio
banner motd # R2, ENCOR Skills Assessment# //Mensaje de inicio router
line con // Acceso a programación de consola
exec-timeout 0// Programación desconexión consola
logging synchro//Programacion ingreso sincrónico
exit//salida

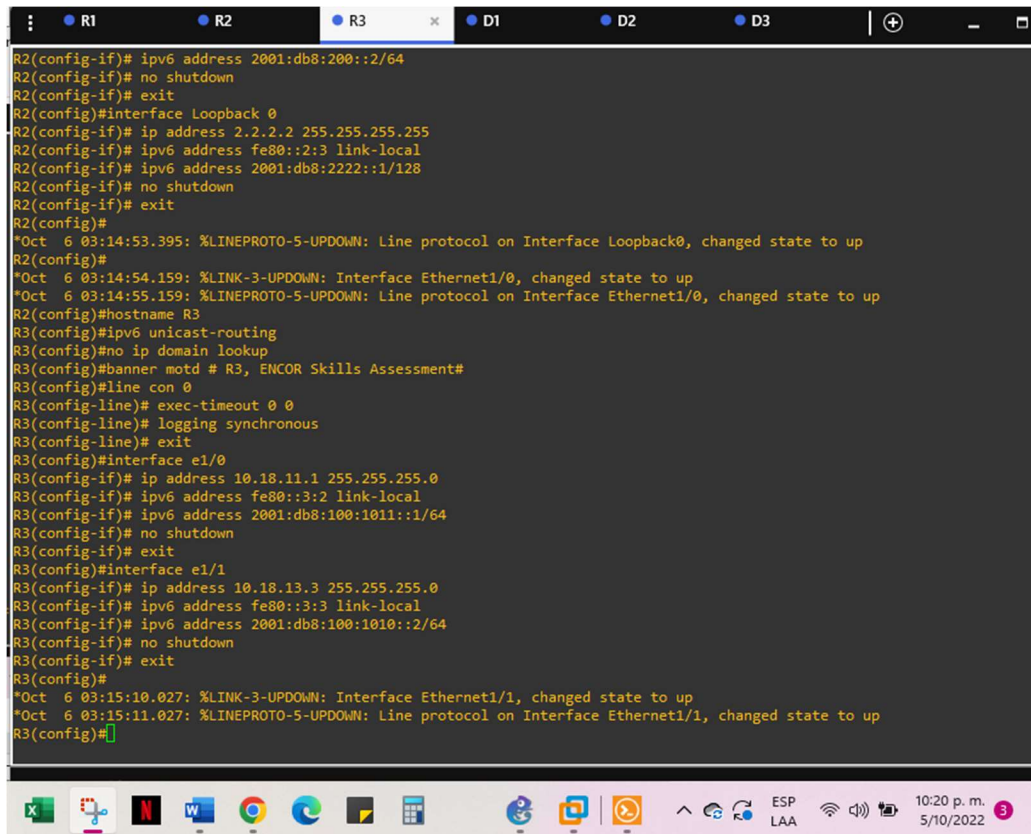
interface e1/0 //Selección interfaz Ethernet 1/0
ip address 209.165.200.226 255.255.255.224 //Dirección ip ipv4
ipv6 address fe80::2:1 link-local //Dirección ip link local
ipv6 address 2001:db8:200::2/64 //Dirección ipv6
no shutdown //Encendido de la interfaz
exit

interface Loopback 0//Selección interfaz loopback
ip address 2.2.2.2 255.255.255.255 //Dirección ip ipv4
ipv6 address fe80::2:3 link-local //Dirección ip link local
ipv6 address 2001:db8:2222::1/128 //Dirección ipv6
no shutdown //Encendido de la interfaz
exit

copy running-config startup-config // Guardar la configuración realizada

```

Ilustración 4 CONFIGURACION R3



```
R2(config-if)# ipv6 address 2001:db8:200::2/64
R2(config-if)# no shutdown
R2(config-if)# exit
R2(config)#interface Loopback 0
R2(config-if)# ip address 2.2.2.2 255.255.255.255
R2(config-if)# ipv6 address fe80::2:3 link-local
R2(config-if)# ipv6 address 2001:db8:2222::1/128
R2(config-if)# no shutdown
R2(config-if)# exit
R2(config)#
*Oct 6 03:14:53.395: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
R2(config)#
*Oct 6 03:14:54.159: %LINK-3-UPDOWN: Interface Ethernet1/0, changed state to up
*Oct 6 03:14:55.159: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to up
R2(config)#hostname R3
R3(config)#ipv6 unicast-routing
R3(config)#no ip domain lookup
R3(config)#banner motd # R3, ENCOR Skills Assessment#
R3(config)#line con 0
R3(config-line)# exec-timeout 0 0
R3(config-line)# logging synchronous
R3(config-line)# exit
R3(config)#interface e1/0
R3(config-if)# ip address 10.18.11.1 255.255.255.0
R3(config-if)# ipv6 address fe80::3:2 link-local
R3(config-if)# ipv6 address 2001:db8:100:1011::1/64
R3(config-if)# no shutdown
R3(config-if)# exit
R3(config)#interface e1/1
R3(config-if)# ip address 10.18.13.3 255.255.255.0
R3(config-if)# ipv6 address fe80::3:3 link-local
R3(config-if)# ipv6 address 2001:db8:100:1010::2/64
R3(config-if)# no shutdown
R3(config-if)# exit
R3(config)#
*Oct 6 03:15:10.027: %LINK-3-UPDOWN: Interface Ethernet1/1, changed state to up
*Oct 6 03:15:11.027: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to up
R3(config)#
```

FUENTE 5 AUTORIA PROPIA

Router R3

```
hostname R3 //nombre router
ipv6 unicast-routing //enrutamiento ipv6
no ip domain lookup // ip dominio
banner motd # R3, ENCOR Skills Assessment //Mensaje de inicio router
line con 0 // programación de consola
exec-timeout 0 0// desconexión consola
logging synchronous// ingreso sincrónico
exit
```

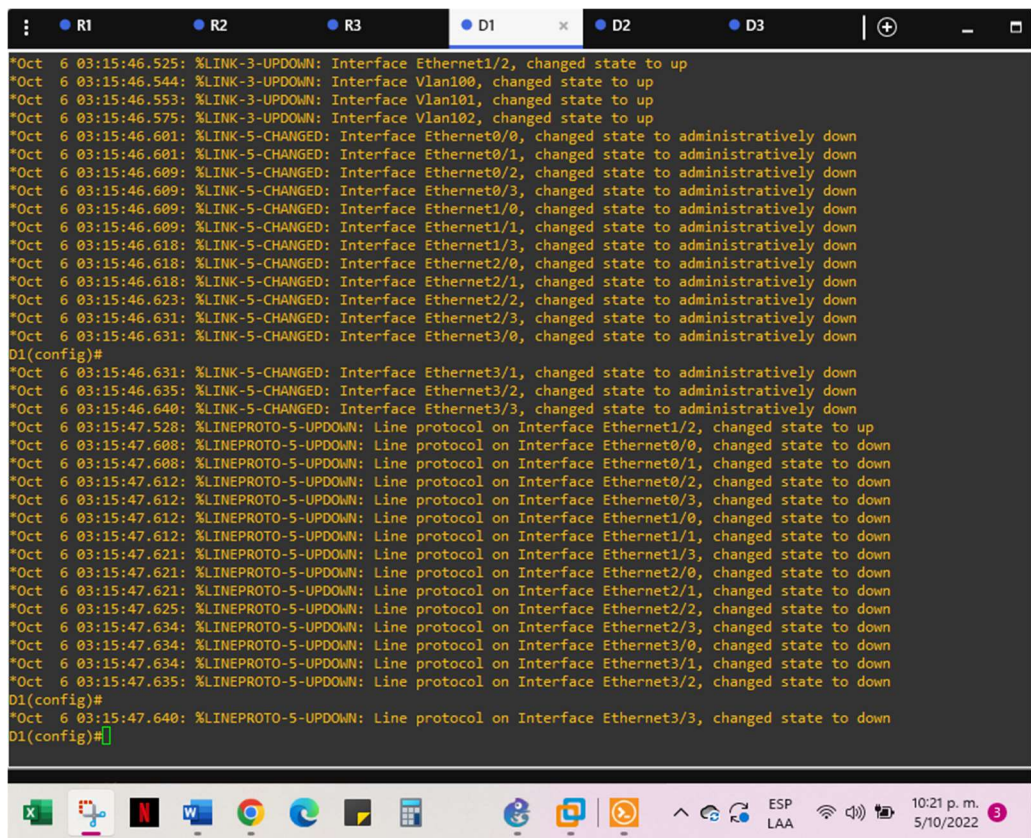
```
interface e1/0 //interfaz Ethernet 1/0
ip address 10.18.11.1 255.255.255.0//Dirección ip ipv4
ipv6 address fe80::3:2 link-local //Dirección ip link local
ipv6 address 2001:db8:100:1011::1/64 //Dirección ipv6
no shutdown //Encendido de interfaz
exit
```

```
interface e1/1 //Selección interfaz Ethernet 1/1
```

```
ip address 10.18.13.3 255.255.255.0 //Dirección ip ipv4
ipv6 address fe80::3:3 link-local //Dirección ip link local
ipv6 address 2001:db8:100:1010::2/64//Dirección ipv6
no shutdown //Encendido de interfaz
exit
```

```
copy running-config startup-config // Guarda configuración realizada
```

Ilustración 5 CONFIGURACION D1



```
*Oct 6 03:15:46.525: %LINK-3-UPDOWN: Interface Ethernet1/2, changed state to up
*Oct 6 03:15:46.544: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
*Oct 6 03:15:46.553: %LINK-3-UPDOWN: Interface Vlan101, changed state to up
*Oct 6 03:15:46.575: %LINK-3-UPDOWN: Interface Vlan102, changed state to up
*Oct 6 03:15:46.601: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Oct 6 03:15:46.601: %LINK-5-CHANGED: Interface Ethernet0/1, changed state to administratively down
*Oct 6 03:15:46.609: %LINK-5-CHANGED: Interface Ethernet0/2, changed state to administratively down
*Oct 6 03:15:46.609: %LINK-5-CHANGED: Interface Ethernet0/3, changed state to administratively down
*Oct 6 03:15:46.609: %LINK-5-CHANGED: Interface Ethernet1/0, changed state to administratively down
*Oct 6 03:15:46.609: %LINK-5-CHANGED: Interface Ethernet1/1, changed state to administratively down
*Oct 6 03:15:46.618: %LINK-5-CHANGED: Interface Ethernet1/3, changed state to administratively down
*Oct 6 03:15:46.618: %LINK-5-CHANGED: Interface Ethernet2/0, changed state to administratively down
*Oct 6 03:15:46.618: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Oct 6 03:15:46.623: %LINK-5-CHANGED: Interface Ethernet2/2, changed state to administratively down
*Oct 6 03:15:46.631: %LINK-5-CHANGED: Interface Ethernet2/3, changed state to administratively down
*Oct 6 03:15:46.631: %LINK-5-CHANGED: Interface Ethernet3/0, changed state to administratively down
D1(config)#
*Oct 6 03:15:46.631: %LINK-5-CHANGED: Interface Ethernet3/1, changed state to administratively down
*Oct 6 03:15:46.635: %LINK-5-CHANGED: Interface Ethernet3/2, changed state to administratively down
*Oct 6 03:15:46.640: %LINK-5-CHANGED: Interface Ethernet3/3, changed state to administratively down
*Oct 6 03:15:47.528: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up
*Oct 6 03:15:47.608: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Oct 6 03:15:47.608: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Oct 6 03:15:47.612: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
*Oct 6 03:15:47.612: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/3, changed state to down
*Oct 6 03:15:47.612: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to down
*Oct 6 03:15:47.612: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to down
*Oct 6 03:15:47.621: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/3, changed state to down
*Oct 6 03:15:47.621: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
*Oct 6 03:15:47.621: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Oct 6 03:15:47.625: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/2, changed state to down
*Oct 6 03:15:47.634: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to down
*Oct 6 03:15:47.634: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Oct 6 03:15:47.634: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Oct 6 03:15:47.635: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
D1(config)#
*Oct 6 03:15:47.640: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
D1(config)#
```

FUENTE 6 AUTORIA PROPIA

```
D1:
hostname D1 //nombre Switch
ip routing //enrutamiento ipv4
ipv6 unicast-routing //enrutamiento ipv6
no ip domain lookup // ip dominio
banner motd # D1, ENCOR Skills Assessment# //Mensaje de inicio router
```

```
line con 0 // A programación de consola
exec-timeout 0 0 //desconexión consola
logging synchronous //Programacion ingreso sincrónico
exit
```

```
vlan 100 //Vlan 100
name Management // Nombre programado de la Vlan 100
exit
```

```
vlan 101 //Programacion Vlan 101
name UserGroupA // Nombre programado de la Vlan 101
exit
```

```
vlan 102 //Programacion Vlan 102
name UserGroupB// Nombre programado de la Vlan 102
exit
```

```
vlan 999 //Programacion Vlan 999
name NATIVE // Nombre programado de la Vlan 999
exit
```

```
interface e1/2 // Programacion interface Ethernet 1/2
no switchport
ip address 10.18.10.2 255.255.255.0 //Dirección ip ipv4
ipv6 address fe80::d1:1 link-local //Dirección ip link local
ipv6 address 2001:db8:100:1010::2/6 //Dirección ip ipv6
no shutdown //Encendido de interfaz
exit
```

```
interface vlan 100// Programacion interface vlan 100
ip address 10.18.100.1 255.255.255.0 //Dirección ip ipv4
ipv6 address fe80::d1:2 link-local //Dirección ip link local
ipv6 address 2001:db8:100:100::1/64 //Dirección ip ipv6
no shutdown //Encendido de interfaz
exit
```

```
interface vlan 101 // Programacion interface vlan 101
ip address 10.18.101.1 255.255.255.0 //Dirección ip ipv4
ipv6 address fe80::d1:3 link-local //Dirección ip link local
ipv6 address 2001:db8:100:101::1/64 //Dirección ip ipv6
no shutdown //Encendido de interfaz
exit
```

```
interface vlan 102 // Programacion interface vlan 102
ip address 10.18.102.1 255.255.255.0 //Dirección ip ipv4
```

```
ipv6 address fe80::d1:4 link-local //Dirección ip link local
ipv6 address 2001:db8:100:102::1/64 //Dirección ip ipv6
no shutdown //Encendido de interfaz
exit
```

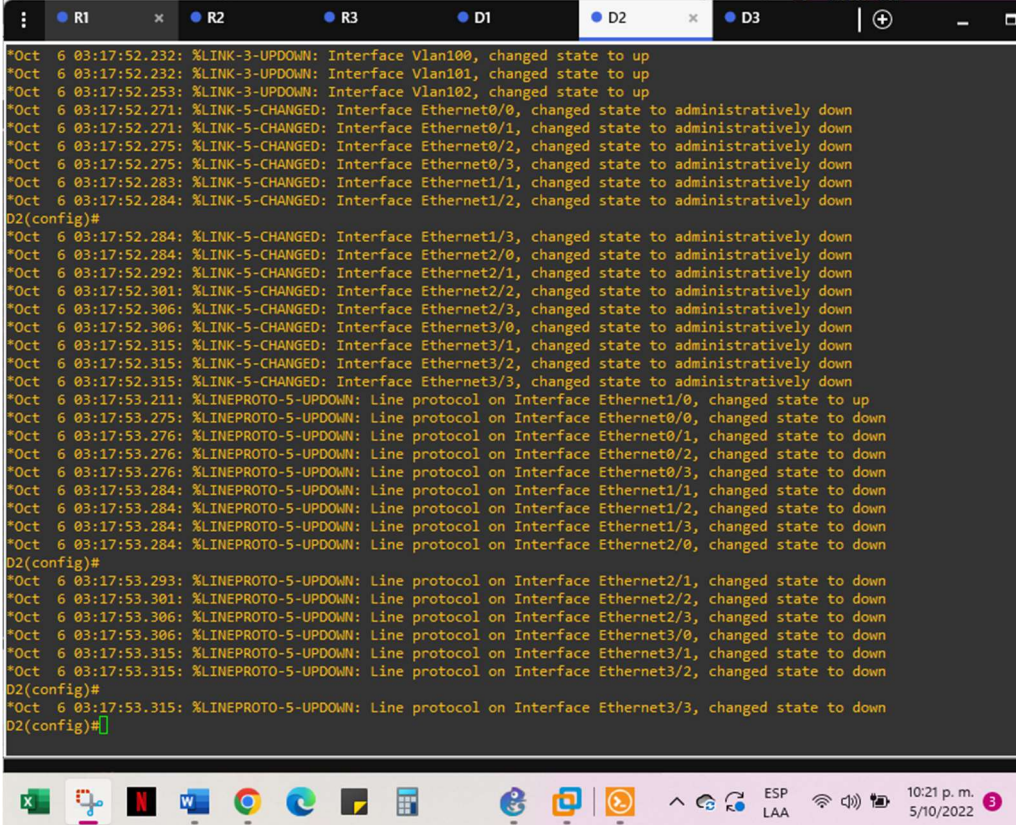
```
ip dhcp excluded-address 10.18.101.1 10.18.101.109 // dirección
DHCP excluida
```

```
ip dhcp excluded-address 10.18.101.141 10.18.101.254// dirección DHCP excluida
ip dhcp excluded-address 10.18.102.1 10.18.102.109// dirección DHCP excluida
ip dhcp excluded-address 10.18.102.141 10.18.102.254//dirección DHCP excluida
ip dhcp pool VLAN-101//Distribuir direcciones ip en la Vlan-101
network 10.18.101.0 255.255.255.0//Rango de direcciones
default-router 10.18.101.254 // Puerta de enlace Vlan-101
exit
```

```
ip dhcp pool VLAN-102 // Distribuir direcciones ip en la Vlan-102
network 10.18.102.0 255.255.255.0//Rango de direcciones
default-router 10.18.102.254// Puerta de enlace Vlan-102
exit
```

```
interface range e0/0-3,e1/0-1,e1/3,e2/0-3,e3/0-3//Programacion rango de interfaces
que no se usaran
shutdown // Apagado de interfaces
exit
```

Ilustración 6 CONFIGURACION D2



```
*Oct 6 03:17:52.232: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
*Oct 6 03:17:52.232: %LINK-3-UPDOWN: Interface Vlan101, changed state to up
*Oct 6 03:17:52.253: %LINK-3-UPDOWN: Interface Vlan102, changed state to up
*Oct 6 03:17:52.271: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Oct 6 03:17:52.271: %LINK-5-CHANGED: Interface Ethernet0/1, changed state to administratively down
*Oct 6 03:17:52.275: %LINK-5-CHANGED: Interface Ethernet0/2, changed state to administratively down
*Oct 6 03:17:52.275: %LINK-5-CHANGED: Interface Ethernet0/3, changed state to administratively down
*Oct 6 03:17:52.283: %LINK-5-CHANGED: Interface Ethernet1/1, changed state to administratively down
*Oct 6 03:17:52.284: %LINK-5-CHANGED: Interface Ethernet1/2, changed state to administratively down
D2(config)#
*Oct 6 03:17:52.284: %LINK-5-CHANGED: Interface Ethernet1/3, changed state to administratively down
*Oct 6 03:17:52.284: %LINK-5-CHANGED: Interface Ethernet2/0, changed state to administratively down
*Oct 6 03:17:52.292: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Oct 6 03:17:52.301: %LINK-5-CHANGED: Interface Ethernet2/2, changed state to administratively down
*Oct 6 03:17:52.306: %LINK-5-CHANGED: Interface Ethernet2/3, changed state to administratively down
*Oct 6 03:17:52.306: %LINK-5-CHANGED: Interface Ethernet3/0, changed state to administratively down
*Oct 6 03:17:52.315: %LINK-5-CHANGED: Interface Ethernet3/1, changed state to administratively down
*Oct 6 03:17:52.315: %LINK-5-CHANGED: Interface Ethernet3/2, changed state to administratively down
*Oct 6 03:17:52.315: %LINK-5-CHANGED: Interface Ethernet3/3, changed state to administratively down
*Oct 6 03:17:53.211: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to up
*Oct 6 03:17:53.275: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Oct 6 03:17:53.276: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/1, changed state to down
*Oct 6 03:17:53.276: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/2, changed state to down
*Oct 6 03:17:53.276: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/3, changed state to down
*Oct 6 03:17:53.284: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to down
*Oct 6 03:17:53.284: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to down
*Oct 6 03:17:53.284: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/3, changed state to down
*Oct 6 03:17:53.284: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to down
D2(config)#
*Oct 6 03:17:53.293: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Oct 6 03:17:53.301: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/2, changed state to down
*Oct 6 03:17:53.306: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to down
*Oct 6 03:17:53.306: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Oct 6 03:17:53.315: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Oct 6 03:17:53.315: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
D2(config)#
*Oct 6 03:17:53.315: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
D2(config)#
```

FUENTE 7 AUTORIA PROPIA

```
D2:
hostname D2 //nombre Switch
ip routing //enrutamiento ipv4
ipv6 unicast-routing //enrutamiento ipv6
no ip domain lookup // búsqueda ip dominio
banner motd # D2, ENCOR Skills Assessment# //Mensaje de inicio router
line con 0//programación de consola
exec-timeout 0 0//desconexión consola
logging synchronous //ingreso sincrónico
exit
```

```
vlan 100 //Programacion Vlan 100
name Management // Nombre programado Vlan 100
exit
```

```
vlan 101 //Programacion Vlan 101
name UserGroupA // Nombre programado Vlan 101
exit
```

```
vlan 102 //Programacion Vlan 102
```

```
name UserGroupB // Nombre programado Vlan 102
exit
```

```
vlan 999 // Programacion Vlan 999
name NATIVE // Nombre programado Vlan 999
exit
```

```
interface e1/0 // Programacion interface Ethernet 1/0
no switchport
ip address 10.18.11.2 255.255.255.0 // Dirección ip ipv4
ipv6 address fe80::d1:1 link-local // Dirección link local
ipv6 address 2001:db8:100:1011::2/64 // Dirección ip ipv6
no shutdown // Encendido de interfaz
exit
```

```
interface vlan 100 // Programacion interface vlan 100
ip address 10.18.100.2 255.255.255.0 // Dirección ip ipv4
ipv6 address fe80::d2:2 link-local // Dirección link local
ipv6 address 2001:db8:100:100::2/64 // Dirección ip ipv6
no shutdown // Encendido de la interfaz
exit
```

```
interface vlan 101 // interface vlan 101
ip address 10.18.101.2 255.255.255.0 // Dirección ip ipv4
ipv6 address fe80::d2:3 link-local // Dirección link local
ipv6 address 2001:db8:100:101::2/64 // Dirección ip ipv6
no shutdown // Encendido de la interfaz
exit
```

```
interface vlan 102 // Programacion interface vlan 101
ip address 10.18.102.2 255.255.255.0 // Dirección ip ipv4
ipv6 address fe80::d2:4 link-local // Dirección link local
ipv6 address 2001:db8:100:102::2/64 // Dirección ip ipv6
no shutdown // Encendido de la interfaz
exit
```

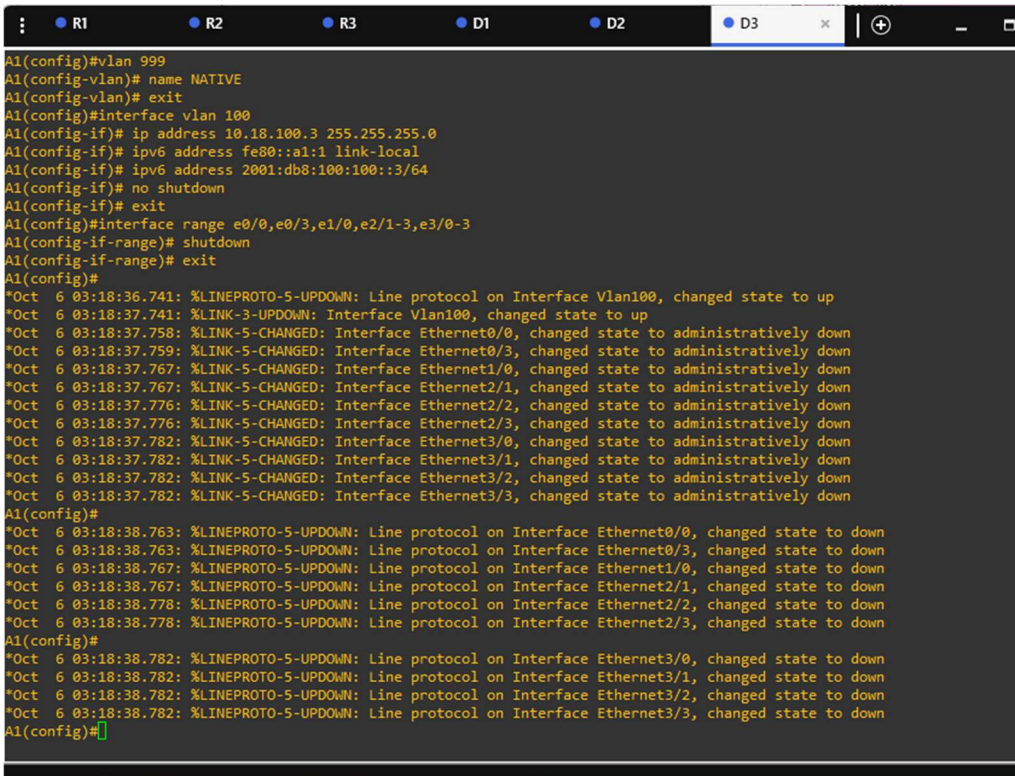
```
ip dhcp excluded-address 10.18.101.1 10.18.101.209 // dirección DHCP
excluida
ip dhcp excluded-address 10.18.101.241 10.18.101.254 // dirección DHCP excluida
ip dhcp excluded-address 10.18.102.1 10.18.102.209 // dirección DHCP excluida
ip dhcp excluded-address 10.18.102.241 10.18.102.254 // dirección DHCP excluida
ip dhcp pool VLAN-101 // Distribuir direcciones ip en la Vlan-101
network 10.18.101.0 255.255.255.0 // Rango de direcciones
default-router 58.0.101.254 // Puerta de enlace Vlan-101
exit
```

```
ip dhcp pool VLAN-102 // Distribuir direcciones ip en la Vlan-102
network 10.18.102.0 255.255.255.0 //Rango de direcciones
default-router 10.18.102.254 // Puerta de enlace Vlan-102
exit
```

```
interface range e0/0-3,e1/1-3,e2/0-3,e3/0-// Programacion rango de interfaces que
no se usaran
shutdown // Apagado de interfaces
exit
```

```
copy running-config startup-config //Guardado configuración
```

Ilustración 7 CONFIGURACION A1



```
A1(config)#vlan 999
A1(config-vlan)# name NATIVE
A1(config-vlan)# exit
A1(config)#interface vlan 100
A1(config-if)# ip address 10.18.100.3 255.255.255.0
A1(config-if)# ipv6 address fe80::a1:1 link-local
A1(config-if)# ipv6 address 2001:db8:100:100::3/64
A1(config-if)# no shutdown
A1(config-if)# exit
A1(config)#interface range e0/0,e0/3,e1/0,e2/1-3,e3/0-3
A1(config-if-range)# shutdown
A1(config-if-range)# exit
A1(config)#
*Oct 6 03:18:36.741: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan100, changed state to up
*Oct 6 03:18:37.741: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
*Oct 6 03:18:37.758: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Oct 6 03:18:37.759: %LINK-5-CHANGED: Interface Ethernet0/3, changed state to administratively down
*Oct 6 03:18:37.767: %LINK-5-CHANGED: Interface Ethernet1/0, changed state to administratively down
*Oct 6 03:18:37.767: %LINK-5-CHANGED: Interface Ethernet2/1, changed state to administratively down
*Oct 6 03:18:37.776: %LINK-5-CHANGED: Interface Ethernet2/2, changed state to administratively down
*Oct 6 03:18:37.776: %LINK-5-CHANGED: Interface Ethernet2/3, changed state to administratively down
*Oct 6 03:18:37.782: %LINK-5-CHANGED: Interface Ethernet3/0, changed state to administratively down
*Oct 6 03:18:37.782: %LINK-5-CHANGED: Interface Ethernet3/1, changed state to administratively down
*Oct 6 03:18:37.782: %LINK-5-CHANGED: Interface Ethernet3/2, changed state to administratively down
*Oct 6 03:18:37.782: %LINK-5-CHANGED: Interface Ethernet3/3, changed state to administratively down
A1(config)#
*Oct 6 03:18:38.763: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to down
*Oct 6 03:18:38.763: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/3, changed state to down
*Oct 6 03:18:38.767: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to down
*Oct 6 03:18:38.767: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Oct 6 03:18:38.778: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/2, changed state to down
*Oct 6 03:18:38.778: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to down
A1(config)#
*Oct 6 03:18:38.782: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Oct 6 03:18:38.782: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Oct 6 03:18:38.782: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
*Oct 6 03:18:38.782: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
A1(config)#
```

FUENTE 8 AUTORIA PROPIA

A1:

```
hostname A1 //nombre Switch
no ip domain lookup // Configuración búsqueda ip dominio
banner motd # A1, ENCOR Skills Assessment# // Mensaje de entrada Switch
line con 0 // programación de consola
```

```
exec-timeout 0 0//Programación desconexión consola
logging synchronous //Programacion ingreso sincrónico
exit
```

```
vlan 100 //Programacion Vlan 100
name Management //Nombre programado Vlan 100
exit
```

```
vlan 101//Programacion Vlan 101
name UserGroupA // programado Vlan 101
exit
```

```
vlan 102//Programacion Vlan 102
name UserGroupB // Nombre programado Vlan 102
exit
```

```
vlan 999 //Programacion Vlan 999
name NATIVE // Nombre programado Vlan 999
exit
```

```
interface vlan 100// Programacion interface
vlan 100
ip address 10.18.100.3 255.255.255.0 // Dirección Ipv4
ipv6 address fe80::a1:1 link-local // Dirección Link local
ipv6 address 2001:db8:100:100::3/64 // Dirección Ipv6
no shutdown // Encendido interfaz
exit
```

```
interface range e0/0,e0/3,e1/0,e2/1-3,e3/0-3 // Programacion rango de interfaces
que no se usaran
shutdown // Apagado de interfaces
exit
```

```
copy running-config startup-config // Guardado configuracion
exit
```

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

```
copy running-config startup-config.
```

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.
 Sus tareas de configuración son las siguientes:

Table 2 Actividad de la Parte 2, Guía de Aprendizaje

Task#	Task	Specification	Points
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	6
2.2	En todos los conmutadores, cambie la VLAN nativa en los enlaces troncales.	Utilice la VLAN 999 como la VLAN nativa.	6
2.3	En todos los conmutadores, habilite el protocolo Rapid Spanning-Tree.	Use Rapid Spanning Tree.	3
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.	Configure D1 y D2 como raíz para las VLAN apropiadas con prioridades que se apoyen mutuamente en caso de falla del conmutador.	2
2.5	En todos los switches, cree LACP EtherChannel como se muestra en el diagrama de topología.	Utilice los siguientes números de canal: D1 a D2 – Port channel 12 D1 a A1 – Port channel 1 D2 a A1 – Port channel 2	3
2.6	En todos los conmutadores, configure los puertos de acceso de host que se conectan a PC1, PC2, PC3 y PC4.	Configure los puertos de acceso con la configuración de VLAN adecuada, como se muestra en el diagrama de topología. Los puertos de host deben pasar inmediatamente al estado de reenvío.	4
2.7	Verifique los servicios DHCP IPv4.	PC2 y PC3 son clientes DHCP y deben recibir direcciones IPv4 válidas.	1

Task#	Task	Specification	Points
2.8	Verifique la conectividad LAN local.	<p>PC1 debería hacer ping con éxito: D1: 10.18.100.1 D2: 10.18.100.2 PC4: 10.18.100.6</p> <p>PC2 debería hacer ping con éxito: D1: 10.18.102.1 D2: 10.18.102.2</p> <p>PC3 debería hacer ping con éxito: D1: 10.18.101.1 D2: 10.18.101.2</p> <p>PC4 debería hacer ping con éxito: D1: 10.18.100.1 D2: 10.18.100.2 PC1: 10.18.100.5</p>	1

FUENTE 9 Prueba de Habilidades CCNP.

Ilustración 8 PING PC1

```

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

PC1> enable
Bad command: "enable". Use ? for help.

PC1> ip 10.18.100.5 255.255.255.0 10.18.100.254
Checking for duplicate address...
PC1 : 10.18.100.5 255.255.255.0 gateway 10.18.100.254

PC1> ip 2001:db8:100:100::5/6
PC1 : 2001:db8:100:100::5/6

PC1> ip 2001:db8:100:100::5/64
PC1 : 2001:db8:100:100::5/64

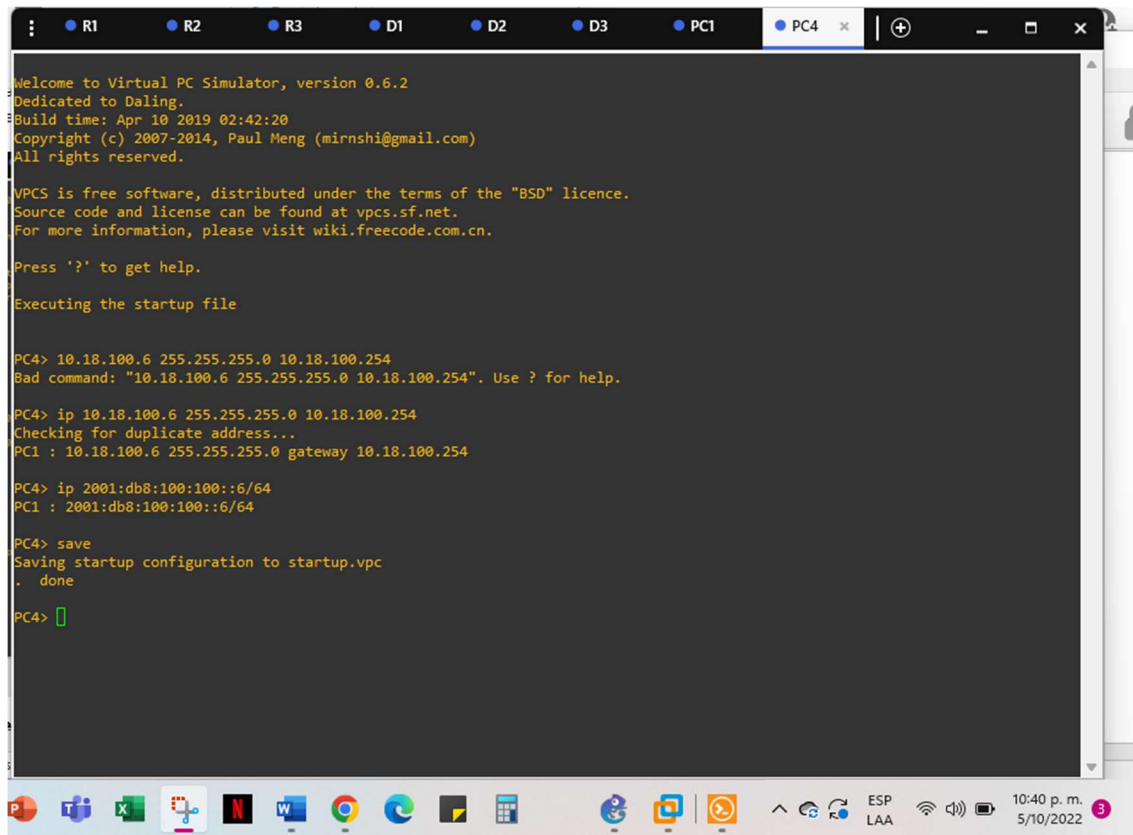
PC1> save
Saving startup configuration to startup.vpc
. done

PC1>

```

FUENTE 10 AUTORIA PROPIA

Ilustración 9 PING PC4



```

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.

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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

PC4> 10.18.100.6 255.255.255.0 10.18.100.254
Bad command: "10.18.100.6 255.255.255.0 10.18.100.254". Use ? for help.

PC4> ip 10.18.100.6 255.255.255.0 10.18.100.254
Checking for duplicate address...
PC1 : 10.18.100.6 255.255.255.0 gateway 10.18.100.254

PC4> ip 2001:db8:100:100::6/64
PC1 : 2001:db8:100:100::6/64

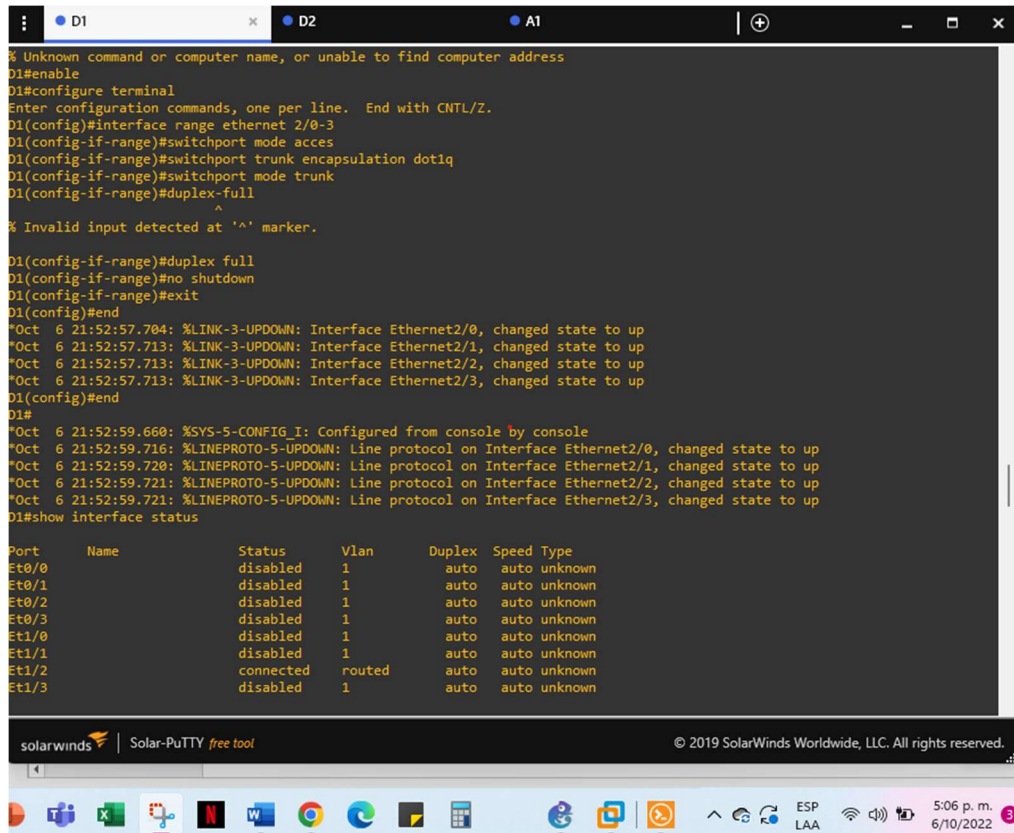
PC4> save
Saving startup configuration to startup.vpc
. done

PC4> 
```

FUENTE 11 AUTORIA PROPIA

2.1 los conmutadores, configuran las interfaces troncales IEEE 802.1Q en los enlaces de conmutador de interconexión

Ilustración 10 CONTRALES IEE D1



```
% Unknown command or computer name, or unable to find computer address
D1#enable
D1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D1(config)#interface range ethernet 2/0-3
D1(config-if-range)#switchport mode access
D1(config-if-range)#switchport trunk encapsulation dot1q
D1(config-if-range)#switchport mode trunk
D1(config-if-range)#duplex-full
D1(config-if-range)#duplex full
^
% Invalid input detected at '^' marker.
D1(config-if-range)#duplex full
D1(config-if-range)#no shutdown
D1(config-if-range)#exit
D1(config)#end
*Oct 6 21:52:57.704: %LINK-3-UPDOWN: Interface Ethernet2/0, changed state to up
*Oct 6 21:52:57.713: %LINK-3-UPDOWN: Interface Ethernet2/1, changed state to up
*Oct 6 21:52:57.713: %LINK-3-UPDOWN: Interface Ethernet2/2, changed state to up
*Oct 6 21:52:57.713: %LINK-3-UPDOWN: Interface Ethernet2/3, changed state to up
D1(config)#end
D1#
*Oct 6 21:52:59.660: %SYS-5-CONFIG_I: Configured from console by console
*Oct 6 21:52:59.716: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
*Oct 6 21:52:59.720: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to up
*Oct 6 21:52:59.721: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/2, changed state to up
*Oct 6 21:52:59.721: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to up
D1#show interface status
```

Port	Name	Status	Vlan	Duplex	Speed	Type
Et0/0		disabled	1	auto	auto	unknown
Et0/1		disabled	1	auto	auto	unknown
Et0/2		disabled	1	auto	auto	unknown
Et0/3		disabled	1	auto	auto	unknown
Et1/0		disabled	1	auto	auto	unknown
Et1/1		disabled	1	auto	auto	unknown
Et1/2		connected	routed	auto	auto	unknown
Et1/3		disabled	1	auto	auto	unknown

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Ilustración 11 CONTRALES IEE D2

```

D1
*Oct 6 21:56:06.152: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet2/3 (999), with D1 Ethernet2/3 (1).
D2(config-if-range)#duplex full
D2(config-if-range)#
*Oct 6 21:56:13.023: %EC-5-L3DONTBNDL2: Et2/2 suspended: LACP currently not enabled on the remote port.
*Oct 6 21:56:13.314: %EC-5-L3DONTBNDL2: Et2/1 suspended: LACP currently not enabled on the remote port.
*Oct 6 21:56:13.397: %EC-5-L3DONTBNDL2: Et2/3 suspended: LACP currently not enabled on the remote port.
*Oct 6 21:56:13.636: %EC-5-L3DONTBNDL2: Et2/0 suspended: LACP currently not enabled on the remote port.
D2(config-if-range)#no shutdown
D2(config-if-range)#end
D2#configure terminal
*Oct 6 21:56:27.668: %SYS-5-CONFIG_I: Configured from console by console
D2#show interface status

Port      Name      Status      Vlan      Duplex  Speed Type
-----
Et0/0     connected 102         auto      auto    unknown
Et0/1     disabled  1           auto      auto    unknown
Et0/2     disabled  1           auto      auto    unknown
Et0/3     disabled  1           auto      auto    unknown
Et1/0     connected routed       auto      auto    unknown
Et1/1     connected trunk        auto      auto    unknown
Et1/2     connected trunk        auto      auto    unknown
Et1/3     disabled  1           auto      auto    unknown
Et2/0     connected trunk        auto      auto    unknown
Et2/1     connected trunk        auto      auto    unknown
Et2/2     connected trunk        auto      auto    unknown
Et2/3     connected trunk        auto      auto    unknown
Et3/0     disabled  1           auto      auto    unknown
Et3/1     disabled  1           auto      auto    unknown
Et3/2     disabled  1           auto      auto    unknown
Et3/3     disabled  1           auto      auto    unknown
Po2       connected unassigned  auto      auto
Po12      connected unassigned  auto      auto
D2#
*Oct 6 21:56:39.568: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet1/2 (999), with A1 Ethernet1/2 (1).
*Oct 6 21:56:39.568: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet1/1 (999), with A1 Ethernet1/1 (1).

```

FUENTE 12 AUTORIA PROPIA

D1:
interface range ethernet 2/0-3 //interfaz a configurar
switchport trunk encapsulation dot1q // encapsulación
switchport mode trunk // interfaz en modo troncal

D2:
interface range ethernet 2/0-3 //interfaz a configurar
switchport trunk encapsulation dot1q //encapsulación
switchport mode trunk // interfaz en modo troncal

A1:
spanning-tree mode rapid-pvst
interface range ethernet 0/1-2 // interfaz a configurar
switchport trunk encapsulation dot1 // encapsulación
switchport mode trunk // interfaz en modo troncal

2.2 En los conmutadores, se cambia la VLAN nativa en los enlaces troncales.

Ilustración 12 CONMUTADORES VLAN D 1

The screenshot shows a terminal window with three tabs labeled D1, D2, and A1. The active tab is D1. The terminal output displays several error messages: '%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet2/0 (1), with D2 Ethernet2/0 (999)'. These messages are repeated for interfaces Ethernet2/3, Ethernet2/2, Ethernet2/1, and Ethernet2/0. Following the errors, the user enters the command 'D1#show vlan brief', which produces a table of VLAN configurations. The table lists VLAN names, their status, and the ports they are active on. The 'default' VLAN (ID 1) is active on all listed ports. Other VLANs include Management (100), UserGroupA (101), UserGroupB (102), NATIVE (999), and several 'default' VLANs for different protocols (1002-1005).

```
D1#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	Et0/0, Et0/1, Et0/2, Et0/3 Et1/0, Et1/1, Et1/3, Et3/0 Et3/1, Et3/2, Et3/3
100 Management	active	
101 UserGroupA	active	
102 UserGroupB	active	
999 NATIVE	active	
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

FUENTE 13 AUTORIA PROPIA

Ilustración 13 CONMUTADORES VLAN D 2

```
*Oct 6 22:10:06.179: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:10:06.206: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:10:06.206: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:10:06.206: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
D2#
*Oct 6 22:11:06.181: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:11:06.211: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:11:06.211: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:11:06.211: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
D2#
*Oct 6 22:12:06.185: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:12:06.211: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:12:06.211: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
*Oct 6 22:12:06.211: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
(1).
D2#show vlan brief
```

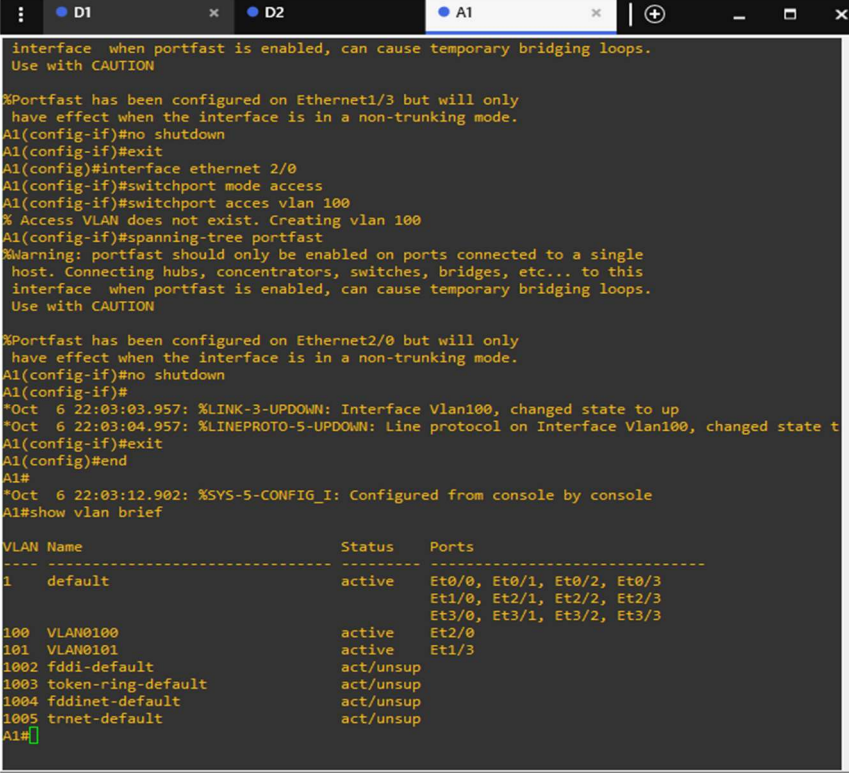
VLAN Name	Status	Ports
1 default	active	Et0/1, Et0/2, Et0/3, Et1/3 Et3/0, Et3/1, Et3/2, Et3/3
100 Management	active	
101 UserGroupA	active	
102 UserGroupB	active	Et0/0
999 NATIVE	active	
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

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FUENTE 14 AUTORIA PROPIA

Ilustración 14 CONMUTADORES VLAN A1



```
interface when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

%Portfast has been configured on Ethernet1/3 but will only
have effect when the interface is in a non-trunking mode.
A1(config-if)#no shutdown
A1(config-if)#exit
A1(config)#interface ethernet 2/0
A1(config-if)#switchport mode access
A1(config-if)#switchport access vlan 100
% Access VLAN does not exist. Creating vlan 100
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 Ethernet2/0 but will only
have effect when the interface is in a non-trunking mode.
A1(config-if)#no shutdown
A1(config-if)#
*Oct 6 22:03:03.957: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
*Oct 6 22:03:04.957: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan100, changed state to up
A1(config-if)#exit
A1(config)#end
A1#
*Oct 6 22:03:12.902: %SYS-5-CONFIG_I: Configured from console by console
A1#show vlan brief

VLAN Name                Status    Ports
-----
1    default                 active    Et0/0, Et0/1, Et0/2, Et0/3
                                           Et1/0, Et2/1, Et2/2, Et2/3
                                           Et3/0, Et3/1, Et3/2, Et3/3
100  VLAN0100                active    Et2/0
101  VLAN0101                active    Et1/3
1002 fddi-default             act/unsup
1003 token-ring-default      act/unsup
1004 fddinet-default         act/unsup
1005 trnet-default          act/unsup
A1#
```

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FUENTE 15 AUTORIA PROPIA

D1:
switchport trunk native vlan 999 // Vlan en enlace troncal
channel-group 12 mode active //Encender el canal 12
no shutdown
exit

D2:
switchport trunk native vlan 999 // Vlan en enlace troncal
channel-group 12 mode active //Encender el canal 12
no shutdown
exit

A1:
switchport trunk native vlan 999 // Vlan en enlace troncal
channel-group 1 mode active //Encender el canal 12
no shutdown
exit

2.3 en los conmutadores se habilita el protocolo Rapid Spanning-Tree.

Ilustración 15 protocolo Rapid Spanning-Tree D1

```
D1#
*Oct 6 22:13:34.714: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
*Oct 6 22:13:34.714: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
*Oct 6 22:13:34.714: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
*Oct 6 22:13:34.714: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
D1#
*Oct 6 22:14:34.718: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
*Oct 6 22:14:34.718: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
*Oct 6 22:14:34.718: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
*Oct 6 22:14:34.718: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
999).
D1#show spanning-tree

VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    32769
            Address    aabb.cc00.0100
            This bridge is the root
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
            Address    aabb.cc00.0100
            Hello Time 2 sec  Max Age 20 sec  Forward Delay 15 sec
            Aging Time 300 sec

Interface    Role Sts Cost      Prio.Nbr Type
-----
Et2/0        Desg FWD 100      128.65 Shr
Et2/1        Desg FWD 100      128.66 Shr
Et2/2        Desg FWD 100      128.67 Shr
Et2/3        Desg FWD 100      128.68 Shr

--More--
```

FUENTE 16 AUTORIA PROPIA

Ilustración 16 protocolo Rapid Spanning-Tree D2

```
VLAN0001
Spanning tree enabled protocol rstp
Root ID    Priority    32769
Address    aabb.cc00.0200
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
Address    aabb.cc00.0200
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface      Role Sts Cost      Prio.Nbr Type
-----
Po2            Desg FWD 56        128.515 Shr

VLAN0100
Spanning tree enabled protocol rstp
Root ID    Priority    28772
--More--
*Oct 6 22:18:11.566: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (999), with D1 Ethernet2/3 (1).
*Oct 6 22:18:11.566: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (999), with D1 Ethernet2/2 (1).
*Oct 6 22:18:11.566: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (999), with D1 Ethernet2/1 (1).
*Oct 6 22:18:11.566: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (999), with D1 Ethernet2/0 (1).
Address    aabb.cc00.0200
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    28772 (priority 28672 sys-id-ext 100)
Address    aabb.cc00.0200
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 300 sec

Interface      Role Sts Cost      Prio.Nbr Type
--More--
```

FUENTE 17 AUTORIA PROPIA

D1:
spanning-tree mode rapid-pvst// activacion spanning-tree

no shutdown // activacion
exit

D2:
spanning-tree mode rapid-pvst // activacion spanning-tree
no shutdown // activacion
exit

A1:
spanning-tree mode rapid-pvst // spanning-tree
no shutdown // activacion
exit

2.4 EN D1 y D2, se configura los puentes raíz RSTP apropiados según la información del diagrama de topología. D1 y D2

Ilustración 17 RSTP D1

```
D1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D1(config)#spanning-tree mode rapid-pvst
D1(config)#spanning-tree vlan 100,102 root primary
D1(config)#spanning-tree vlan 101 root secondary
D1(config)#interface ethernet 0/0
D1(config-if)#switchport mode access
D1(config-if)#
*Oct 6 22:26:34.745: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (1), with D2 Ethernet2/1 (999).
*Oct 6 22:26:34.745: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (1), with D2 Ethernet2/0 (999).
*Oct 6 22:26:34.753: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (1), with D2 Ethernet2/3 (999).
*Oct 6 22:26:34.753: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (1), with D2 Ethernet2/2 (999).
D1(config-if)#switchport acces vlan 100
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)#exit
D1(config)#exit
D1#
*Oct 6 22:27:20.493: %SYS-5-CONFIG_I: Configured from console by console
D1#no shutdown
^
% Invalid input detected at '^' marker.

D1#
*Oct 6 22:27:34.748: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (1), with D2 Ethernet2/1 (999).
*Oct 6 22:27:34.748: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (1), with D2 Ethernet2/0 (999).
*Oct 6 22:27:34.761: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (1), with D2 Ethernet2/3 (999).
*Oct 6 22:27:34.761: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
```

FUENTE 18 AUTORIA PROPIA

Ilustración 18 RSTP D2

```
Oct 6 22:26:11.589: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (999), with D1 Ethernet2/0 (1).
D2#
Oct 6 22:27:11.589: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (999), with D1 Ethernet2/3 (1).
Oct 6 22:27:11.589: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (999), with D1 Ethernet2/2 (1).
Oct 6 22:27:11.589: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (999), with D1 Ethernet2/1 (1).
Oct 6 22:27:11.589: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (999), with D1 Ethernet2/0 (1).
D2#
Oct 6 22:28:11.590: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (999), with D1 Ethernet2/1 (1).
Oct 6 22:28:11.590: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (999), with D1 Ethernet2/0 (1).
Oct 6 22:28:11.590: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (999), with D1 Ethernet2/3 (1).
Oct 6 22:28:11.590: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (999), with D1 Ethernet2/2 (1).
D2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D2(config)#
Oct 6 22:29:11.594: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (999), with D1 Ethernet2/3 (1).
Oct 6 22:29:11.594: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (999), with D1 Ethernet2/2 (1).
Oct 6 22:29:11.594: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (999), with D1 Ethernet2/1 (1).
Oct 6 22:29:11.594: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (999), with D1 Ethernet2/0 (1).
D2(config)#spanning-tree mode rapid-pvst
D2(config)#spanning-tree vlan 100,102 root primary
D2(config)#spanning-tree vlan 101 root secondary
D2(config)#interface ethernet 0/0
D2(config-if)#switchport mode access
D2(config-if)#switchport access vlan 100
D2(config-if)#spanning-tree portfast
D2(config-if)#no shutdown
D2(config-if)#exit
D2(config)#
```

FUENTE 19 AUTORIA PROPIA

D1
spanning-tree vlan 100,102 root primary
spanning-tree vlan 101 root secondary

D2:
spanning-tree vlan 101 root primary
spanning-tree vlan 100,102 root secondary

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

Ilustración 19 LACP EtherChannels D1

```
*Oct 6 22:30:34.757: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (1), with D2 Ethernet2/1 (999).
*Oct 6 22:30:34.757: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (1), with D2 Ethernet2/0 (999).
*Oct 6 22:30:34.769: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (1), with D2 Ethernet2/3 (999).
*Oct 6 22:30:34.769: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (1), with D2 Ethernet2/2 (999).
D1#
*Oct 6 22:31:34.761: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (1), with D2 Ethernet2/1 (999).
*Oct 6 22:31:34.761: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (1), with D2 Ethernet2/0 (999).
*Oct 6 22:31:34.769: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (1), with D2 Ethernet2/3 (999).
*Oct 6 22:31:34.769: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (1), with D2 Ethernet2/2 (999).
D1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D1(config)#interface range ethernet 2/0-3
D1(config-if-range)#switchport trunk encapsulation
*Oct 6 22:32:34.766: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (1), with D2 Ethernet2/1 (999).
*Oct 6 22:32:34.766: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (1), with D2 Ethernet2/0 (999).
*Oct 6 22:32:34.774: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (1), with D2 Ethernet2/3 (999).
*Oct 6 22:32:34.774: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (1), with D2 Ethernet2/2 (999).
D1(config-if-range)#switchport trunk encapsulation dot1q
D1(config-if-range)#switchport mode trunk
D1(config-if-range)#switchport trunk native vlan 999
D1(config-if-range)#channel-group 12 mode active
Creating a port-channel interface Port-channel 12
D1(config-if-range)#no shutdown
*Oct 6 22:33:41.590: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed
state to up
D1(config-if-range)#no shutdown
D1(config-if-range)#exit
D1(config)#
```

FUENTE 20 AUTORIA PROPIA

Ilustración 20LACP EtherChannels D2

```
D1 D2 A1
D2/2 (999), with D1 Ethernet2/2 (1).
D2(config)#
Oct 6 22:33:11.603: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/1 (999), with D1 Ethernet2/1 (1).
Oct 6 22:33:11.603: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/0 (999), with D1 Ethernet2/0 (1).
Oct 6 22:33:11.614: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/2 (999), with D1 Ethernet2/2 (1).
Oct 6 22:33:11.614: %CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on Ethernet
2/3 (999), with D1 Ethernet2/3 (1).
D2(config)#
Oct 6 22:33:41.598: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed
state to up
D2(config)#interface range ethernet 0/1-2
D2(config-if-range)#exit
D2(config)#interface range ethernet 2/0-3
D2(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
D2(config-if-range)#switchport trunk encapsulation dot1q
^
% Invalid input detected at '^' marker.
D2(config-if-range)#switchport mode trunk
D2(config-if-range)#switchport trunk native vlan 999
^
% Invalid input detected at '^' marker.
D2(config-if-range)#switchport trunk native vlan 999
^
% Invalid input detected at '^' marker.
D2(config-if-range)#switchport trunk native vlan 999
^
% Invalid input detected at '^' marker.
D2(config-if-range)#switchport trunk native vlan 999
D2(config-if-range)#channel-group 12 mode active
D2(config-if-range)#no shutdown
D2(config-if-range)#
```

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FUENTE 21 AUTORIA PROPIA

Ilustración 21 LACP EtherChannels A1

```
protocol on Interface Ethernet0/3, changed state to down
*Oct 11 03:43:07.969: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/3, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/2, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
*Oct 11 03:43:08.906: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Oct 11 03:43:08.916: %LINK-5-CHANGED: Interface Ethernet0/3, changed state to administratively down
*Oct 11 03:43:08.975: %LINK-5-CHANGED: Interface Vlan1, changed state to administratively down
*Oct 11 03:43:09.215: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
*Oct 11 03:43:09.862: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to up
*Oct 11 03:43:09.905: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to up
*Oct 11 03:43:10.216: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan100, changed state to up A1, ENCOR
nt
A1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
A1(config)#interface ethernet 1/3
A1(config-if)#switchport mode access
A1(config-if)#switchport access vlan 101
A1(config-if)#spanning-tree portfast
A1(config-if)#no shutdown
A1(config-if)#exit
A1(config)#interface ethernet 2/0
A1(config-if)#switchport mode access
A1(config-if)#switchport access vlan 100
A1(config-if)#spanning-tree portfast
A1(config-if)#no shutdown
A1(config-if)#
```

FUENTE 22 AUTORIA PROPIA

D1 a D2 canal 12

D1:
interface range ethernet 2/0-3 // interfaz rango
channel-group 12 mode active//channel 12 mode

D2:
interface range ethernet 2/0-3// interfaz rango
channel-group 12 mode active// channel 12 mode

D1 a A1 CANAL 1

D1:
interface range ethernet 0/1-2
channel-group 1 mode active

A1:
interface range ethernet 0/1-2// interfaz rango
channel-group 1 mode active//activacion mode 1

D2 a A1 CANAL 2

D1:

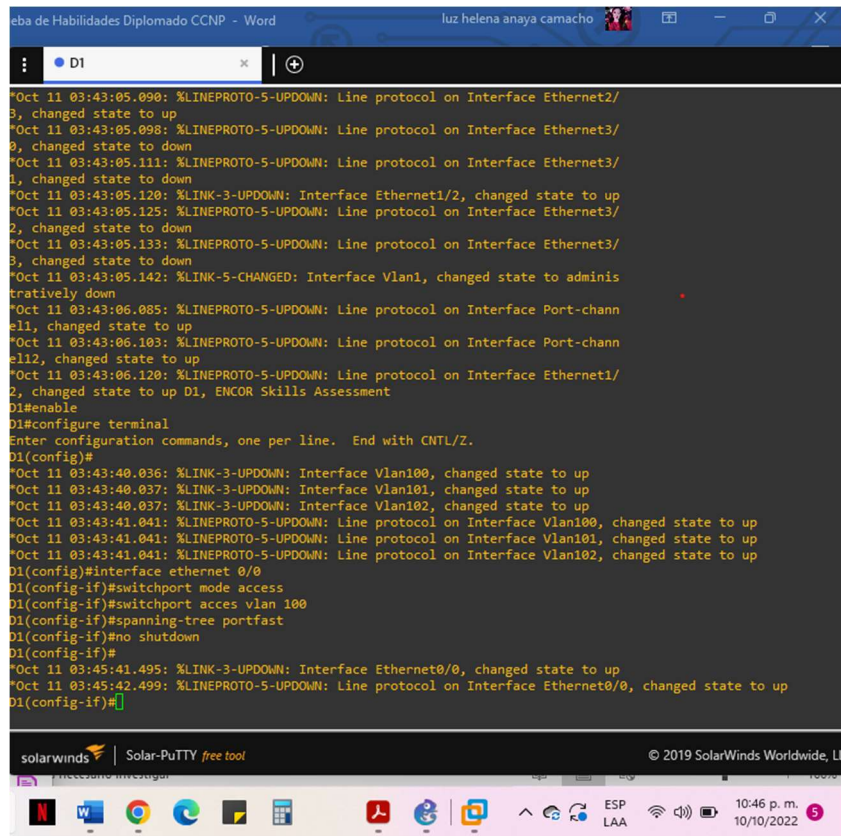
interface range ethernet 1/1-2// interfaz rango
channel-group 2 mode active// activacion mode 2

A1:

interface range ethernet 1/1-2// interfaz rango
channel-group 2 mode active// activacion mode 2

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

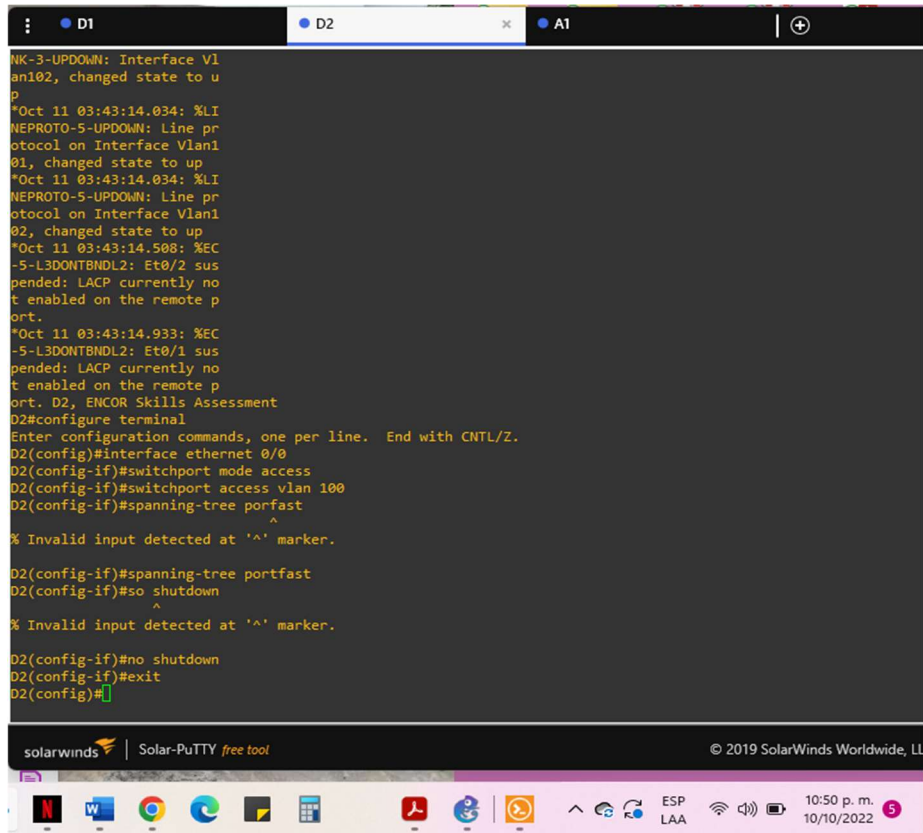
Ilustración 22 LACP EtherChannels D1



```
Oct 11 03:43:05.090: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to up
Oct 11 03:43:05.098: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
Oct 11 03:43:05.111: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
Oct 11 03:43:05.120: %LINK-3-UPDOWN: Interface Ethernet1/2, changed state to up
Oct 11 03:43:05.125: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
Oct 11 03:43:05.133: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
Oct 11 03:43:05.142: %LINK-5-CHANGED: Interface Vlan1, changed state to administratively down
Oct 11 03:43:06.085: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel11, changed state to up
Oct 11 03:43:06.103: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel12, changed state to up
Oct 11 03:43:06.120: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up D1, ENCOR Skills Assessment
D1#enable
D1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D1(config)#
Oct 11 03:43:40.036: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
Oct 11 03:43:40.037: %LINK-3-UPDOWN: Interface Vlan101, changed state to up
Oct 11 03:43:40.037: %LINK-3-UPDOWN: Interface Vlan102, changed state to up
Oct 11 03:43:41.041: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan100, changed state to up
Oct 11 03:43:41.041: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan101, changed state to up
Oct 11 03:43:41.041: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan102, changed state to up
D1(config)#interface ethernet 0/0
D1(config-if)#switchport mode access
D1(config-if)#switchport access vlan 100
D1(config-if)#spanning-tree portfast
D1(config-if)#no shutdown
D1(config-if)#
Oct 11 03:45:41.495: %LINK-3-UPDOWN: Interface Ethernet0/0, changed state to up
Oct 11 03:45:42.499: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/0, changed state to up
D1(config-if)#
```

FUENTE 23 AUTORIA PROPIA

Ilustración 23 LACP EtherChannels D2



```

NK-3-UPDOWN: Interface Vlan102, changed state to up
*Oct 11 03:43:14.034: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan101, changed state to up
*Oct 11 03:43:14.034: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan102, changed state to up
*Oct 11 03:43:14.508: %EC-5-L3DONTBNDL2: Et0/2 suspended: LACP currently not enabled on the remote port.
*Oct 11 03:43:14.933: %EC-5-L3DONTBNDL2: Et0/1 suspended: LACP currently not enabled on the remote port.
D2, ENCOR Skills Assessment
D2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D2(config)#interface ethernet 0/0
D2(config-if)#switchport mode access
D2(config-if)#switchport access vlan 100
D2(config-if)#spanning-tree portfast
^
% Invalid input detected at '^' marker.
D2(config-if)#spanning-tree portfast
D2(config-if)#so shutdown
^
% Invalid input detected at '^' marker.
D2(config-if)#no shutdown
D2(config-if)#exit
D2(config)#

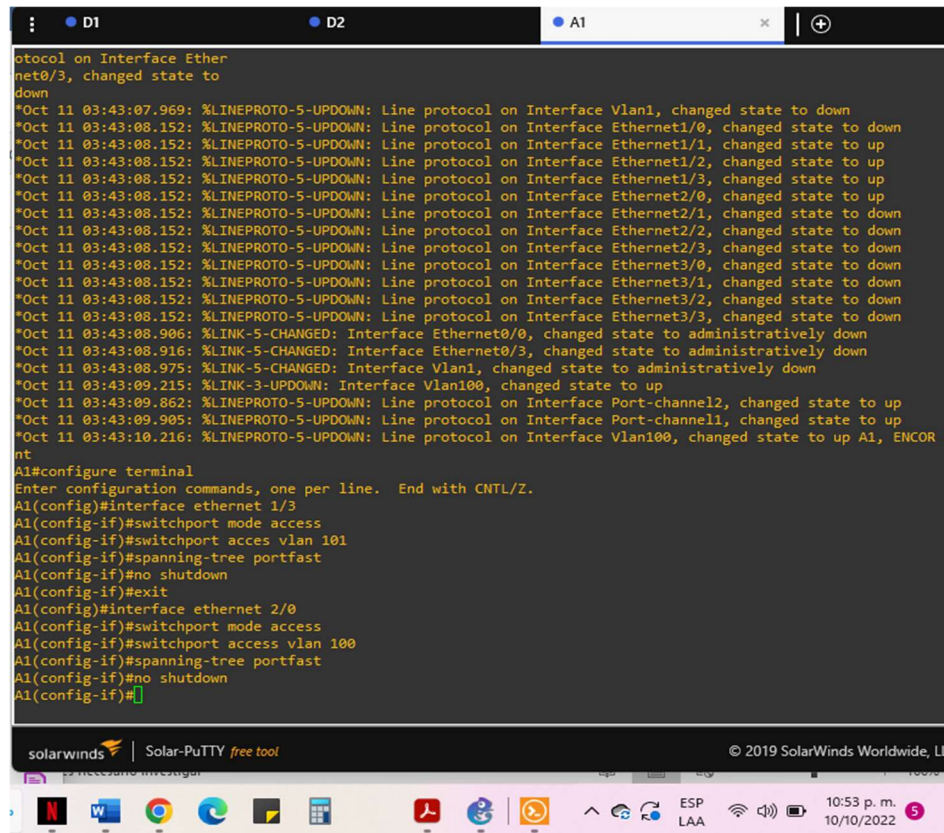
```

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FUENTE 24 AUTORIA PROPIA

Ilustración 24 A1



```
protocol on Interface Ether
net0/3, changed state to
down
*Oct 11 03:43:07.969: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/0, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/1, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/3, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/0, changed state to up
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/1, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/2, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet2/3, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/0, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/1, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/2, changed state to down
*Oct 11 03:43:08.152: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet3/3, changed state to down
*Oct 11 03:43:08.906: %LINK-5-CHANGED: Interface Ethernet0/0, changed state to administratively down
*Oct 11 03:43:08.916: %LINK-5-CHANGED: Interface Ethernet0/3, changed state to administratively down
*Oct 11 03:43:08.975: %LINK-5-CHANGED: Interface Vlan1, changed state to administratively down
*Oct 11 03:43:09.215: %LINK-3-UPDOWN: Interface Vlan100, changed state to up
*Oct 11 03:43:09.862: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel2, changed state to up
*Oct 11 03:43:09.905: %LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to up
*Oct 11 03:43:10.216: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan100, changed state to up A1, ENCOR
nt
A1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
A1(config)#interface ethernet 1/3
A1(config-if)#switchport mode access
A1(config-if)#switchport access vlan 101
A1(config-if)#spanning-tree portfast
A1(config-if)#no shutdown
A1(config-if)#exit
A1(config)#interface ethernet 2/0
A1(config-if)#switchport mode access
A1(config-if)#switchport access vlan 100
A1(config-if)#spanning-tree portfast
A1(config-if)#no shutdown
A1(config-if)#
```

FUENTE 25 AUTORIA PROPIA

D1:
interface ethernet 0/0// interfaz
switchport mode access// acceso modo switchport
switchport acces vlan 100// acceso switchport vlan
spanning-tree portfast // accesos capa 2
no shutdown// no activar
exit

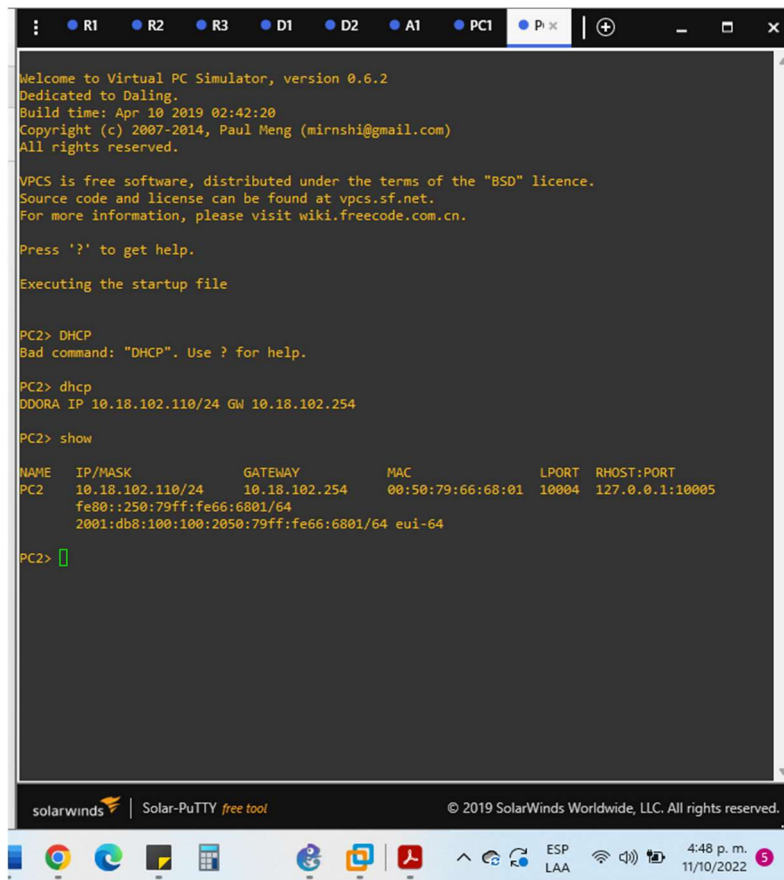
D2:
interface ethernet 0/0 // interfaz
switchport mode access// acceso modo switchport
switchport acces vlan 102 // acceso switchport vlan
spanning-tree portfast// accesos capa 2
no shutdown// no activar

A1:
interface ethernet 1/3 // interfaz
switchport mode access // acceso modo switchport
switchport acces vlan 101// acceso switchport vlan

```
spanning-tree portfast // accesos capa 2
no shutdown // no activar
exit
```

```
interface ethernet 2/0 // interfaz
switchport mode access // acceso modo switchport
switchport access vlan 100 //
spanning-tree portfast // accesos capa 2
no shutdown // no activar
exit
```

2.7 Verificación de los Servicios DHCP IPv4.



```
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> DHCP
Bad command: "DHCP". Use ? for help.

PC2> dhcp
DDORA IP 10.18.102.110/24 GW 10.18.102.254

PC2> show

NAME      IP/MASK      GATEWAY      MAC              LPORT  RHOST:PORT
PC2       10.18.102.110/24  10.18.102.254  00:50:79:66:68:01  10004  127.0.0.1:10005
          fe80::250:79ff:fe66:6801/64
          2001:db8:100:100:2050:79ff:fe66:6801/64 eui-64

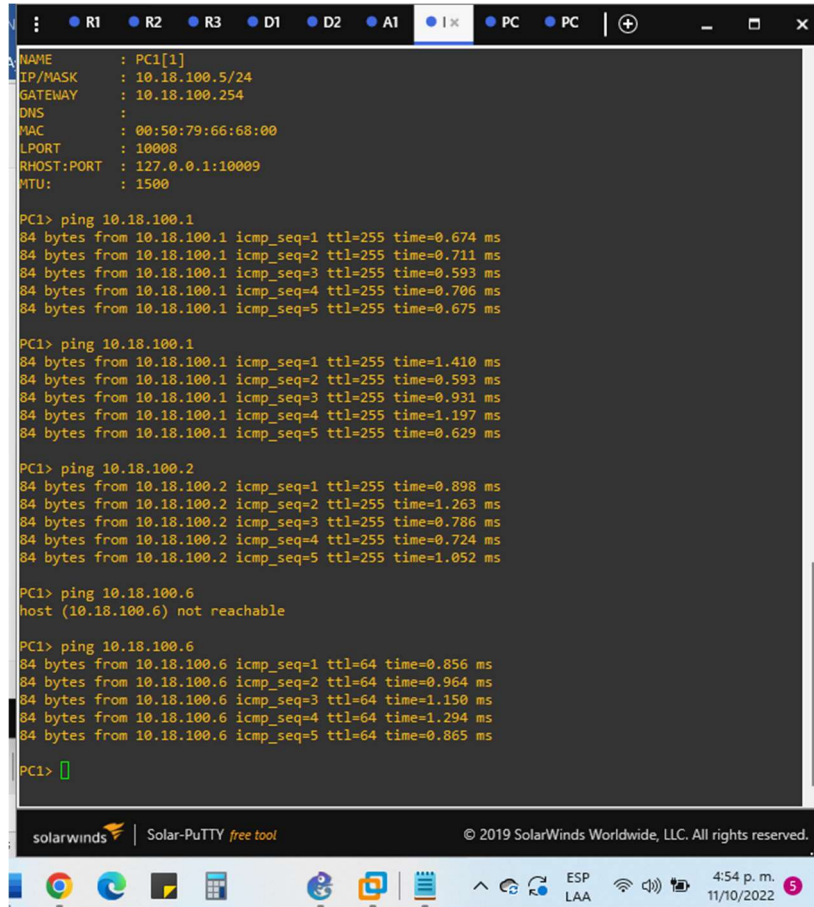
PC2> []
```

The screenshot shows a terminal window titled "Virtual PC Simulator" with a dark background and light text. The terminal output displays the simulator's version (0.6.2), build time (Apr 10 2019 02:42:20), and copyright information (© 2007-2014, Paul Meng). It also mentions the BSD license and provides a link to the source code at vpcs.sf.net. The user enters the command 'DHCP', which results in a "Bad command" error. Then, the user enters 'dhcp', which successfully configures the PC with the IP address 10.18.102.110/24 and gateway 10.18.102.254. Finally, the user enters 'show', which displays a table of network configuration details for PC2, including IP/MASK, GATEWAY, MAC, LPORT, and RHOST:PORT. The table shows the IPv4 configuration and the corresponding IPv6 addresses (fe80::250:79ff:fe66:6801/64 and 2001:db8:100:100:2050:79ff:fe66:6801/64 eui-64). The terminal window is running on a Windows operating system, as indicated by the taskbar at the bottom showing the Start button, taskbar icons, and system tray with the date and time (4:48 p. m. 11/10/2022).

FUENTE 26 AUTORIA PROPIA

2.8 Se verifica la conectividad LAN local

Ilustración 25 PING



```
NAME      : PC1[1]
IP/MASK   : 10.18.100.5/24
GATEWAY   : 10.18.100.254
DNS       :
MAC       : 00:50:79:66:68:00
LPORT     : 10008
RHOST:PORT : 127.0.0.1:10009
MTU       : 1500

PC1> ping 10.18.100.1
84 bytes from 10.18.100.1 icmp_seq=1 ttl=255 time=0.674 ms
84 bytes from 10.18.100.1 icmp_seq=2 ttl=255 time=0.711 ms
84 bytes from 10.18.100.1 icmp_seq=3 ttl=255 time=0.593 ms
84 bytes from 10.18.100.1 icmp_seq=4 ttl=255 time=0.706 ms
84 bytes from 10.18.100.1 icmp_seq=5 ttl=255 time=0.675 ms

PC1> ping 10.18.100.1
84 bytes from 10.18.100.1 icmp_seq=1 ttl=255 time=1.410 ms
84 bytes from 10.18.100.1 icmp_seq=2 ttl=255 time=0.593 ms
84 bytes from 10.18.100.1 icmp_seq=3 ttl=255 time=0.931 ms
84 bytes from 10.18.100.1 icmp_seq=4 ttl=255 time=1.197 ms
84 bytes from 10.18.100.1 icmp_seq=5 ttl=255 time=0.629 ms

PC1> ping 10.18.100.2
84 bytes from 10.18.100.2 icmp_seq=1 ttl=255 time=0.898 ms
84 bytes from 10.18.100.2 icmp_seq=2 ttl=255 time=1.263 ms
84 bytes from 10.18.100.2 icmp_seq=3 ttl=255 time=0.786 ms
84 bytes from 10.18.100.2 icmp_seq=4 ttl=255 time=0.724 ms
84 bytes from 10.18.100.2 icmp_seq=5 ttl=255 time=1.052 ms

PC1> ping 10.18.100.6
host (10.18.100.6) not reachable

PC1> ping 10.18.100.6
84 bytes from 10.18.100.6 icmp_seq=1 ttl=64 time=0.856 ms
84 bytes from 10.18.100.6 icmp_seq=2 ttl=64 time=0.964 ms
84 bytes from 10.18.100.6 icmp_seq=3 ttl=64 time=1.150 ms
84 bytes from 10.18.100.6 icmp_seq=4 ttl=64 time=1.294 ms
84 bytes from 10.18.100.6 icmp_seq=5 ttl=64 time=0.865 ms

PC1> 
```

FUENTE 27 AUTORIA PROPIA

Ilustración 26 PING 2

```
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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> DHCP
Bad command: "DHCP". Use ? for help.

PC2> dhcp
DDORA IP 10.18.102.110/24 GW 10.18.102.254

PC2> show

NAME IP/MASK GATEWAY MAC LPORT RHOST:PORT
PC2 10.18.102.110/24 10.18.102.254 00:50:79:66:68:01 10004 127.0.0.1:10005
fe80::250:79ff:fe66:6801/64
2001:db8:100:100:2050:79ff:fe66:6801/64 eui-64

PC2> ping 10.18.102.1
84 bytes from 10.18.102.1 icmp_seq=1 ttl=255 time=0.772 ms
84 bytes from 10.18.102.1 icmp_seq=2 ttl=255 time=1.519 ms
84 bytes from 10.18.102.1 icmp_seq=3 ttl=255 time=0.913 ms
84 bytes from 10.18.102.1 icmp_seq=4 ttl=255 time=0.872 ms
84 bytes from 10.18.102.1 icmp_seq=5 ttl=255 time=0.991 ms

PC2> 10.18.102.2
Bad command: "10.18.102.2". Use ? for help.

PC2> ping 10.18.102.2
84 bytes from 10.18.102.2 icmp_seq=1 ttl=255 time=0.604 ms
84 bytes from 10.18.102.2 icmp_seq=2 ttl=255 time=1.123 ms
84 bytes from 10.18.102.2 icmp_seq=3 ttl=255 time=0.752 ms
84 bytes from 10.18.102.2 icmp_seq=4 ttl=255 time=0.729 ms
84 bytes from 10.18.102.2 icmp_seq=5 ttl=255 time=0.748 ms

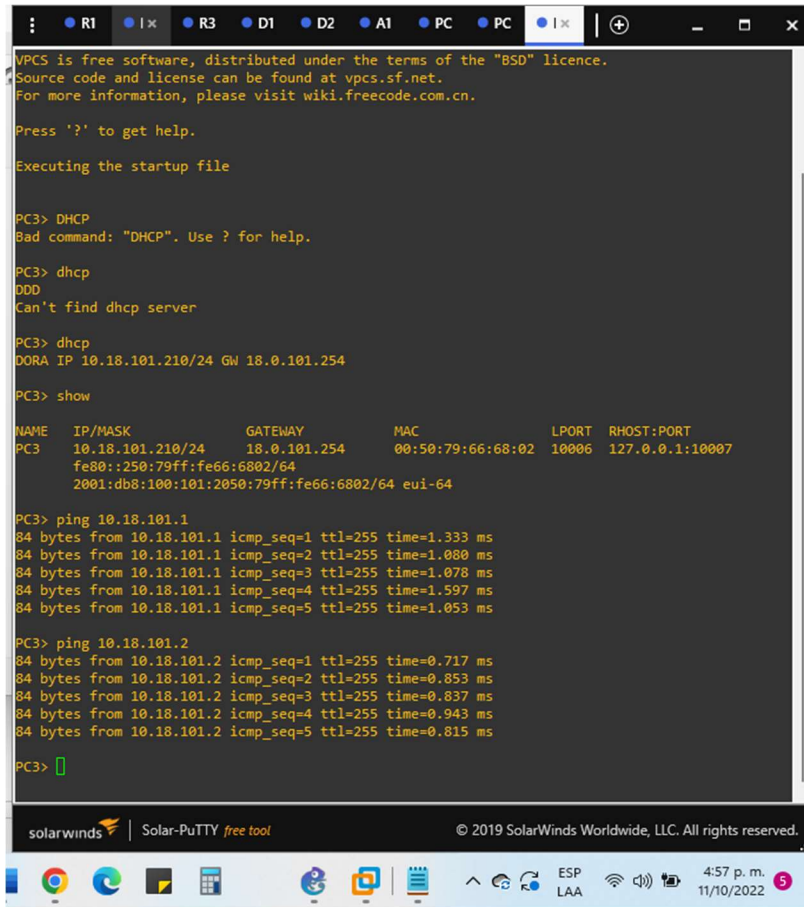
PC2> █
```

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FUENTE 28 AUTORIA PROPIA

Ilustración 27 PING 3



```
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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> DHCP
Bad command: "DHCP". Use ? for help.

PC3> dhcp
DDD
Can't find dhcp server

PC3> dhcp
DORA IP 10.18.101.210/24 GW 18.0.101.254

PC3> show

NAME IP/MASK GATEWAY MAC LPORT RHOST:PORT
PC3 10.18.101.210/24 18.0.101.254 00:50:79:66:68:02 10006 127.0.0.1:10007
fe80::250:79ff:fe66:6802/64
2001:db8:100:101:2050:79ff:fe66:6802/64 eui-64

PC3> ping 10.18.101.1
84 bytes from 10.18.101.1 icmp_seq=1 ttl=255 time=1.333 ms
84 bytes from 10.18.101.1 icmp_seq=2 ttl=255 time=1.080 ms
84 bytes from 10.18.101.1 icmp_seq=3 ttl=255 time=1.078 ms
84 bytes from 10.18.101.1 icmp_seq=4 ttl=255 time=1.597 ms
84 bytes from 10.18.101.1 icmp_seq=5 ttl=255 time=1.053 ms

PC3> ping 10.18.101.2
84 bytes from 10.18.101.2 icmp_seq=1 ttl=255 time=0.717 ms
84 bytes from 10.18.101.2 icmp_seq=2 ttl=255 time=0.853 ms
84 bytes from 10.18.101.2 icmp_seq=3 ttl=255 time=0.837 ms
84 bytes from 10.18.101.2 icmp_seq=4 ttl=255 time=0.943 ms
84 bytes from 10.18.101.2 icmp_seq=5 ttl=255 time=0.815 ms

PC3> 
```

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FUENTE 29 AUTORIA PROPIA

ESCENARIO 2

Se configurará los protocolos de enrutamiento IPv4 e IPv6. Al final de esta parte, la red debe estar completamente convergente. Los pings de IPv4 e IPv6 a la interfaz Loopback 0 desde D1 y D2 deberían ser exitosos.

Nota: Los pings de los hosts no tendrán éxito porque sus puertas de enlace predeterminadas apuntan a la dirección HSRP que se habilitará en la Parte 4. Sus tareas de configuración son las siguientes:

Table 3 Actividad de la Parte 3, Guía de Aprendizaje

Task#	Task	Specification	Points
3.1	<p>En la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv2 de área única en el área 0.</p>	<p>Utilice el ID de proceso OSPF 4 y asigne los siguientes ID de enrutador: R1: 0.0.4.1 R3: 0.0.4.3 D1: 0.0.4.131 D2: 0.0.4.132</p> <p>En R1, R3, D1 y D2, anuncie todas las redes/VLAN conectadas directamente en el Área 0.</p> <p>En R1, no anuncie la red R1 – R2.</p> <p>En el R1, propague una ruta predeterminada. Tenga en cuenta que BGP proporcionará la ruta predeterminada.</p> <p>Deshabilite los anuncios OSPFv2 en:</p> <p>D1: Todas las interfaces excepto E1/2. D2: Todas las interfaces excepto E1/0.</p>	8

Task#	Task	Specification	Points
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.	<p>Configure dos rutas resumidas estáticas a la interfaz Null 0:</p> <ul style="list-style-type: none"> • Una ruta IPv4 resumida para 10.18.0.0/8. • Una ruta IPv6 resumida para 2001:db8:100::/48. <p>Configure R1 en BGP ASN 300 y use la identificación del enrutador 1.1.1.1.</p> <p>Configure una relación de vecino IPv4 e IPv6 con R2 en ASN 500.</p> <p>En la familia de direcciones IPv4:</p> <ul style="list-style-type: none"> • Deshabilitar la relación de vecino IPv6. • Habilite la relación de vecino IPv4. • Anuncie la red 10.18.0.0/8. <p>En la familia de direcciones IPv6:</p> <ul style="list-style-type: none"> • Deshabilitar la relación de vecino IPv4. • Habilite la relación de vecino IPv6. • Anuncie la red 2001:db8:100::/48. 	8

Task#	Task	Specification	Points
3.3	En R2 en la "Red ISP", configure MP-BGP.	<p>Configure dos rutas estáticas predeterminadas a través de la interfaz Loopback 0:</p> <ul style="list-style-type: none"> • Una ruta estática predeterminada de IPv4. • Una ruta estática predeterminada de IPv6. <p>Configure R2 en BGP ASN 500 y use la identificación del enrutador 2.2.2.2.</p> <p>Configure y habilite una relación de vecino IPv4 e IPv6 con R1 en ASN 300.</p> <p>En la familia de direcciones IPv4, anuncie:</p> <ul style="list-style-type: none"> • La red Loopback 0 IPv4 (/32). • La ruta por defecto (0.0.0.0/0). <p>En la familia de direcciones IPv6, anuncie:</p> <ul style="list-style-type: none"> • La red Loopback 0 IPv6 (/128). • La ruta por defecto (::/0). 	4

Task#	Task	Specification	Points
3.4	En R1 en la "Red ISP", configure MP-BGP.	<p>Configure dos rutas resumidas estáticas a la interfaz Null 0:</p> <ul style="list-style-type: none"> • Una ruta IPv4 resumida para 10.18.0.0/8. • Una ruta IPv6 resumida para 2001:db8:100::/48. <p>Configure R1 en BGP ASN 300 y use la identificación del enrutador 1.1.1.1.</p> <p>Configure una relación de vecino IPv4 e IPv6 con R2 en ASN 500.</p> <p>En la familia de direcciones IPv4:</p> <ul style="list-style-type: none"> • Deshabilitar la relación de vecino IPv6. • Habilite la relación de vecino IPv4. • Anuncie la red 10.18.0.0/8. <p>En la familia de direcciones IPv6:</p> <ul style="list-style-type: none"> • Deshabilitar la relación de vecino IPv4. • Habilite la relación de vecino IPv6. • Anuncie la red 2001:db8:100::/48. 	4

FUENTE 30 Prueba de Habilidades CCNP.

3.1 En la "Red empresarial" (es decir, R1, R3, D1 y D2), configure OSPFv2

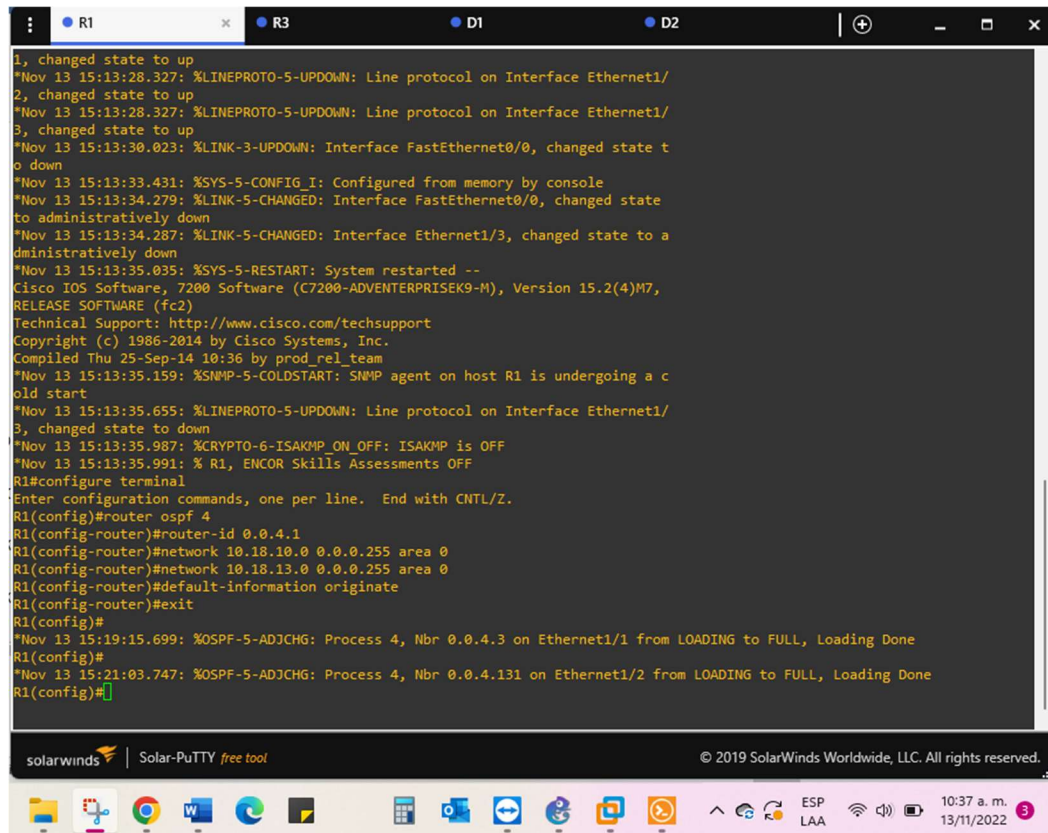
R1:

```

router ospf 4 //preceso opsf 6
router-id 0.0.4.1//id de R1
network 10.18.10.0 0.0.0.255 area 0// notificacion
network 10.18.13.0 0.0.0.255 area 0// notificacion
default-information originate// ruta por defecto
exit

```

Ilustración 28 3.1 En la "Red empresarial" (es decir, R1, R3, D1 y D2), configure OSPFv2 R1



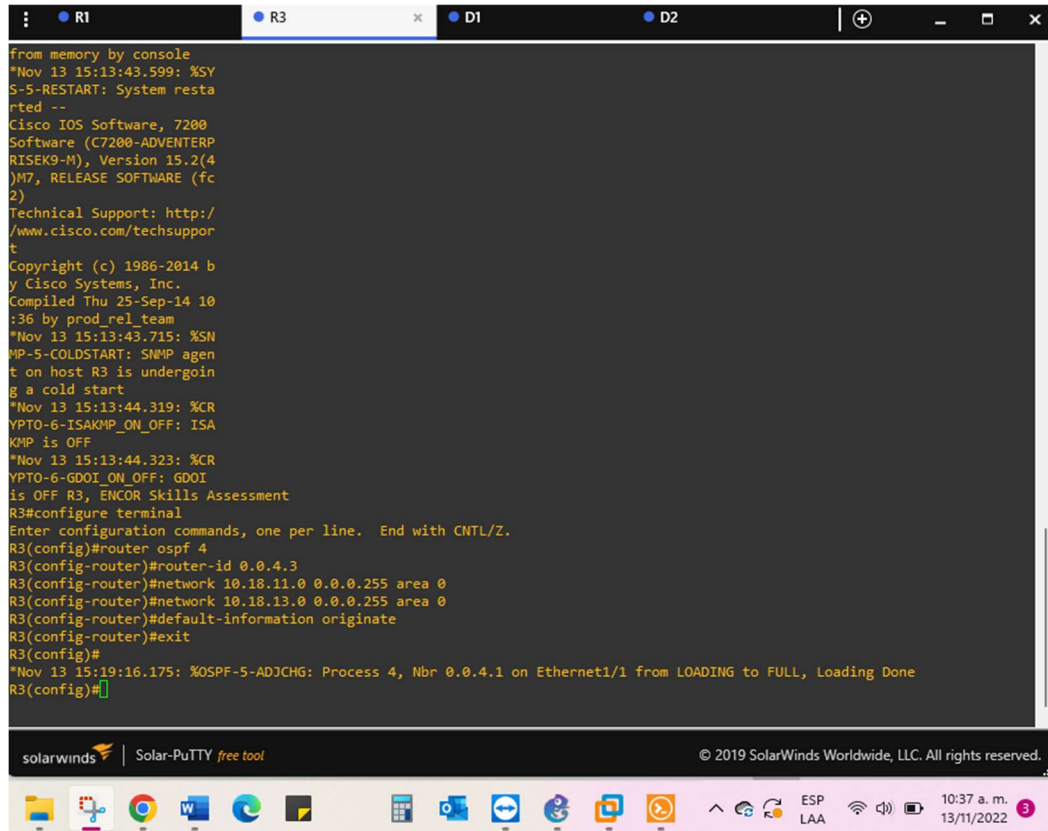
```
R1
1, changed state to up
*Nov 13 15:13:28.327: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/
2, changed state to up
*Nov 13 15:13:28.327: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/
3, changed state to up
*Nov 13 15:13:30.023: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state t
o down
*Nov 13 15:13:33.431: %SYS-5-CONFIG_I: Configured from memory by console
*Nov 13 15:13:34.279: %LINK-5-CHANGED: Interface FastEthernet0/0, changed state
to administratively down
*Nov 13 15:13:34.287: %LINK-5-CHANGED: Interface Ethernet1/3, changed state to a
ministratively down
*Nov 13 15:13:35.035: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 7200 Software (C7200-ADVENTERPRISEK9-M), Version 15.2(4)M7,
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Thu 25-Sep-14 10:36 by prod_rel_team
*Nov 13 15:13:35.159: %SNMP-5-COLDSTART: SNMP agent on host R1 is undergoing a c
old start
*Nov 13 15:13:35.655: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/
3, changed state to down
*Nov 13 15:13:35.987: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Nov 13 15:13:35.991: % R1, ENCOR Skills Assessments OFF
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf 4
R1(config-router)#router-id 0.0.4.1
R1(config-router)#network 10.18.10.0 0.0.0.255 area 0
R1(config-router)#network 10.18.13.0 0.0.0.255 area 0
R1(config-router)#default-information originate
R1(config-router)#exit
R1(config)#
*Nov 13 15:19:15.699: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.3 on Ethernet1/1 from LOADING to FULL, Loading Done
R1(config)#
*Nov 13 15:21:03.747: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.131 on Ethernet1/2 from LOADING to FULL, Loading Done
R1(config)#
```

FUENTE 31 AUTORIA PROPIA

R3

```
router ospf 4// proceso ospf 4
router-id 0.0.4.3//id de R3
network 10.18.11.0 0.0.0.255 area 0// notificacion
network 10.18.13.0 0.0.0.255 area 0// notificacion
default-information originate// ruta por defecto
exit
```

Ilustración 29 3.1 En la "Red empresarial" (es decir, R1, R3, D1 y D2), configure OSPFv2 R3



```
from memory by console
*Nov 13 15:13:43.599: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 7200 Software (C7200-ADVENTERPRISEK9-M), Version 15.2(4)M7, RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Thu 25-Sep-14 10:36 by prod_rel_team
*Nov 13 15:13:43.715: %SNMP-5-COLDSTART: SNMP agent on host R3 is undergoing a cold start
*Nov 13 15:13:44.319: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Nov 13 15:13:44.323: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF R3, ENCOR Skills Assessment
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 4
R3(config-router)#router-id 0.0.4.3
R3(config-router)#network 10.18.11.0 0.0.0.255 area 0
R3(config-router)#network 10.18.13.0 0.0.0.255 area 0
R3(config-router)#default-information originate
R3(config-router)#exit
R3(config)#
*Nov 13 15:19:16.175: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.1 on Ethernet1/1 from LOADING to FULL, Loading Done
R3(config)#
```

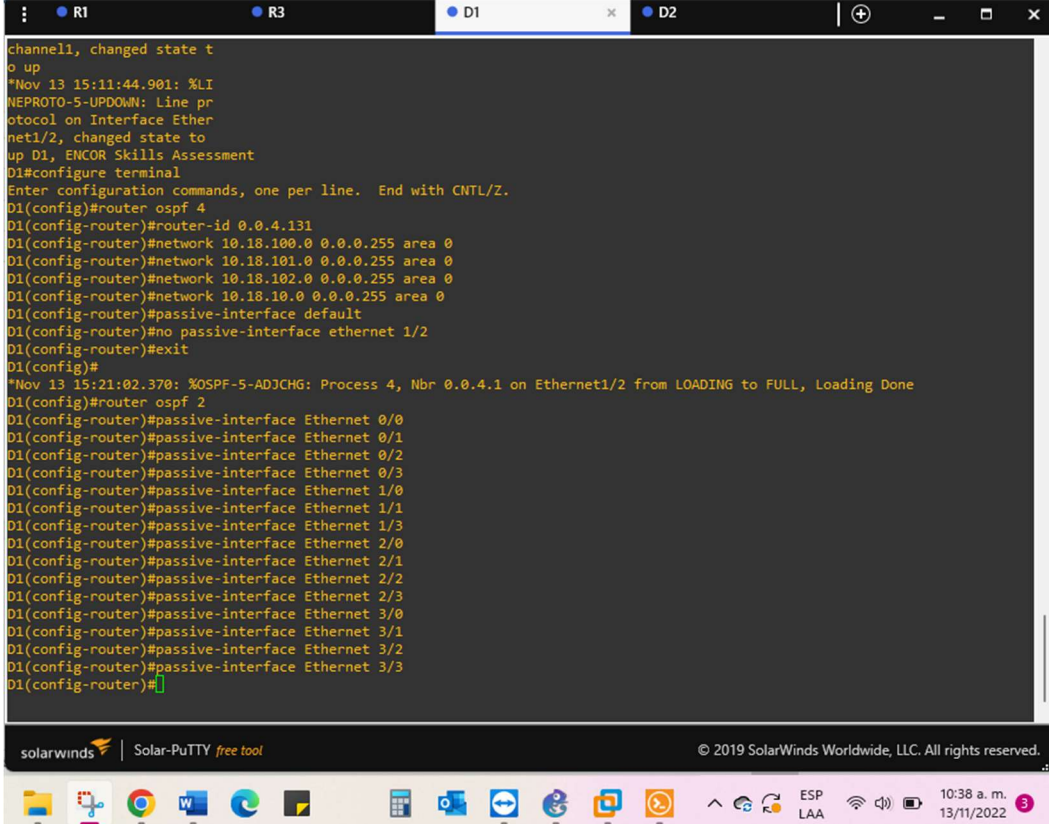
FUENTE 32 AUTORIA PROPIA

D1

```
router ospf 4// proceso ospf 4
router-id 0.0.4.131// id de R1
network 10.18.100.0 0.0.0.255 area 0// notificacion
network 10.18.101.0 0.0.0.255 area 0//notificacion
network 10.18.102.0 0.0.0.255 area 0//notificacion
Deshabilite los anuncios OSPFv2 en D1 todas las interfaces excepto E1/2
passive-interface Ethernet 0/0
passive-interface Ethernet 0/1
passive-interface Ethernet 0/2
passive-interface Ethernet 0/3
passive-interface Ethernet 1/0
passive-interface Ethernet 1/1
passive-interface Ethernet 1/3
passive-interface Ethernet 2/0
passive-interface Ethernet 2/1
passive-interface Ethernet 2/2
passive-interface Ethernet 2/3
```

passive-interface Ethernet 3/0
passive-interface Ethernet 3/1
passive-interface Ethernet 3/2
passive-interface Ethernet 3/3

Ilustración 30 3.1 En la "Red empresarial" (es decir, R1, R3, D1 y D2), configure OSPFv2 D1



```
channel1, changed state to up
*Nov 13 15:11:44.901: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet1/2, changed state to up
D1, ENCOR Skills Assessment
D1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D1(config)#router ospf 4
D1(config-router)#router-id 0.0.4.131
D1(config-router)#network 10.18.100.0 0.0.0.255 area 0
D1(config-router)#network 10.18.101.0 0.0.0.255 area 0
D1(config-router)#network 10.18.102.0 0.0.0.255 area 0
D1(config-router)#network 10.18.10.0 0.0.0.255 area 0
D1(config-router)#passive-interface default
D1(config-router)#no passive-interface ethernet 1/2
D1(config-router)#exit
D1(config)#
*Nov 13 15:21:02.370: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.1 on Ethernet1/2 from LOADING to FULL, Loading Done
D1(config)#router ospf 2
D1(config-router)#passive-interface Ethernet 0/0
D1(config-router)#passive-interface Ethernet 0/1
D1(config-router)#passive-interface Ethernet 0/2
D1(config-router)#passive-interface Ethernet 0/3
D1(config-router)#passive-interface Ethernet 1/0
D1(config-router)#passive-interface Ethernet 1/1
D1(config-router)#passive-interface Ethernet 1/3
D1(config-router)#passive-interface Ethernet 2/0
D1(config-router)#passive-interface Ethernet 2/1
D1(config-router)#passive-interface Ethernet 2/2
D1(config-router)#passive-interface Ethernet 2/3
D1(config-router)#passive-interface Ethernet 3/0
D1(config-router)#passive-interface Ethernet 3/1
D1(config-router)#passive-interface Ethernet 3/2
D1(config-router)#passive-interface Ethernet 3/3
D1(config-router)#
```

FUENTE 33 AUTORIA PROPIA

D2

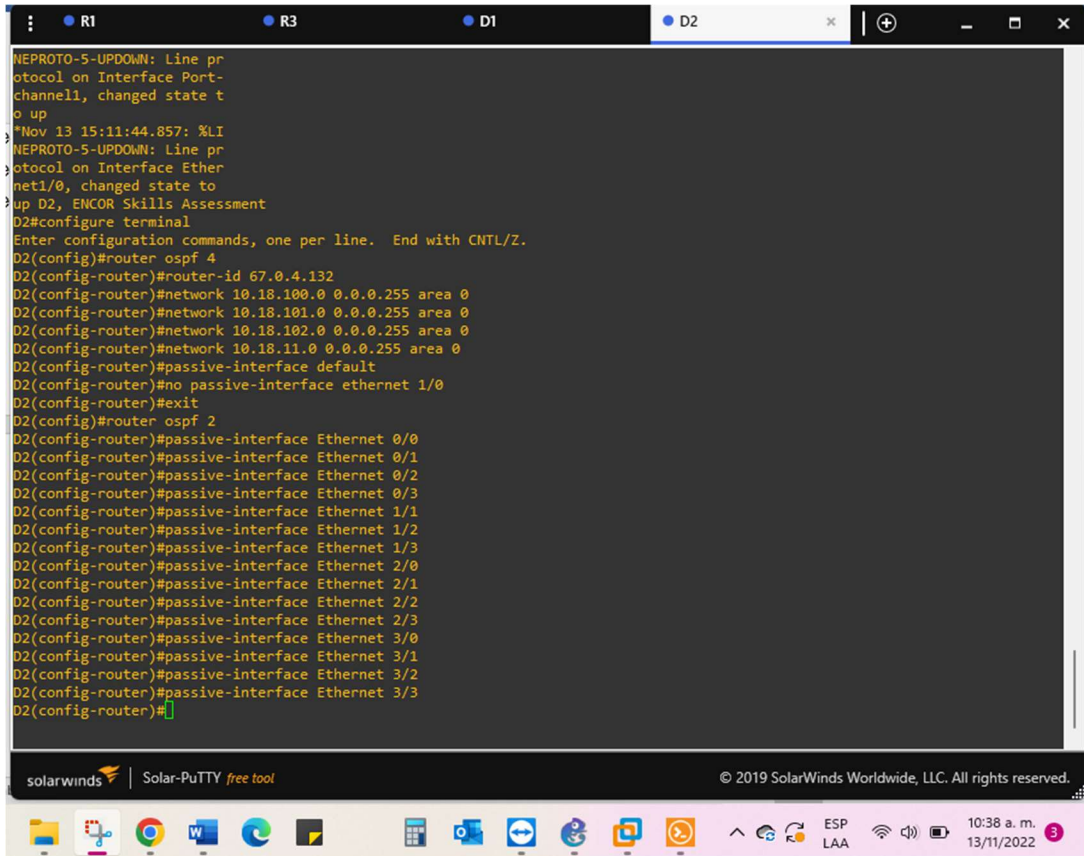
```
router ospf 4 // proceso ospf 4
router-id 67.0.4.132 // id de D2
network 10.18.100.0 0.0.0.255 area 0 // Notificacion
network 10.18.101.0 0.0.0.255 area 0 // Notificacion
network 10.18.102.0 0.0.0.255 area 0 // Notificacion
network 10.18.11.0 0.0.0.255 area 0 // Notificacion
passive-interface default // interfaces pasivas
no passive-interface ethernet 1/0 // no pasiva
exit
```

```
network 10.18.10.0 0.0.0.255 area 0 //notificacion
passive-interface default// interfaces pasivas
no passive-interface ethernet 1/2// no pasiva
exit
```

Deshabilite los anuncios OSPFv2 en D2 Todas las interfaces excepto E1/0

```
passive-interface Ethernet 0/0
passive-interface Ethernet 0/1
passive-interface Ethernet 0/2
passive-interface Ethernet 0/3
passive-interface Ethernet 1/1
passive-interface Ethernet 1/2
passive-interface Ethernet 1/3
passive-interface Ethernet 2/0
passive-interface Ethernet 2/1
passive-interface Ethernet 2/2
passive-interface Ethernet 2/3
passive-interface Ethernet 3/0
passive-interface Ethernet 3/1
passive-interface Ethernet 3/2
passive-interface Ethernet 3/3
```

Ilustración 31 3.1 En la "Red empresarial" (es decir, R1, R3, D1 y D2), configure OSPFv2 D2



```
NEPROTO-5-UPDOWN: Line pr
otocol on Interface Port-
channell, changed state t
o up
*Nov 13 15:11:44.857: %LI
NEPROTO-5-UPDOWN: Line pr
otocol on Interface Ether
net1/0, changed state to
up D2, ENCOR Skills Assessment
D2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D2(config)#router ospf 4
D2(config-router)#router-id 67.0.4.132
D2(config-router)#network 10.18.100.0 0.0.0.255 area 0
D2(config-router)#network 10.18.101.0 0.0.0.255 area 0
D2(config-router)#network 10.18.102.0 0.0.0.255 area 0
D2(config-router)#network 10.18.11.0 0.0.0.255 area 0
D2(config-router)#passive-interface default
D2(config-router)#no passive-interface ethernet 1/0
D2(config-router)#exit
D2(config)#router ospf 2
D2(config-router)#passive-interface Ethernet 0/0
D2(config-router)#passive-interface Ethernet 0/1
D2(config-router)#passive-interface Ethernet 0/2
D2(config-router)#passive-interface Ethernet 0/3
D2(config-router)#passive-interface Ethernet 1/1
D2(config-router)#passive-interface Ethernet 1/2
D2(config-router)#passive-interface Ethernet 1/3
D2(config-router)#passive-interface Ethernet 2/0
D2(config-router)#passive-interface Ethernet 2/1
D2(config-router)#passive-interface Ethernet 2/2
D2(config-router)#passive-interface Ethernet 2/3
D2(config-router)#passive-interface Ethernet 3/0
D2(config-router)#passive-interface Ethernet 3/1
D2(config-router)#passive-interface Ethernet 3/2
D2(config-router)#passive-interface Ethernet 3/3
D2(config-router)#
```

FUENTE 34 AUTORIA PROPIA

3.2 En la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv3 R1

```
router ospf 6//proceso ospf 6
router-id 0.0.4.1// id para R2
network 10.18.10.0 0.0.0.255 area 0//notificacion
network 10.18.13.0 0.0.0.255 area 0//notificacion
default-information originate// ruta por defecto
exit
```

```
ipv6 router ospf 6// proceso ospf 6
router-id 0.0.6.1// id de R1
default-information originate// ruta por defecto
exit
```

```
interface ethernet 1/2//intefaz
ipv6 ospf 6 area 0//intefaz conectada
```

```
exit
interface ethernet 1/1//interfaz
ipv6 ospf 6 area 0// interfaz conectada
exit
```

Ilustración 32 la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv3 R1



```
R1
R1
R3
D1
D2

R1(config-rtr)#router-id 0.0.6.1
R1(config-rtr)#default-information originate
R1(config-rtr)#exit
R1(config)#interface ethernet 1/2
R1(config-if)#ipv6 ospf 6 area 0
R1(config-if)#exit
R1(config)#interface ethernet 1/1
R1(config-if)#ipv6 ospf 6 area 0
R1(config-if)#exit
*Nov 13 22:36:47.103: %OSPFv3-5-ADJCHG: Process 6, Nbr 0.0.6.3 on Ethernet1/1 from LOADING to FULL, Loading Done
R1(config-if)#exit
R1(config)#ip route 10.18.0.0 255.255.252.0 null0
R1(config)#ipv6 route 2001:db8:100::/48 null0
R1(config)#router bgp 300
R1(config-router)#bgp router-id 1.1.1.1
R1(config-router)#neighbor 209.165.200.226 remote-as 500
R1(config-router)#neighbor 2001:db8:200::2 remote-as 500
R1(config-router)#address-family ipv4 unicast
R1(config-router-af)#neighbor 209.165.200.226 activate
R1(config-router-af)#no neighbor 2001:db8:200::2 activate
R1(config-router-af)#network 10.18.0.0 mask 255.255.252.0
R1(config-router-af)#exit-address-family
R1(config-router)#address-family ipv6 unicast
R1(config-router-af)#no neighbor 209.165.200.226 activate
R1(config-router-af)#neighbor 2001:db8:200::2 activate
R1(config-router-af)#network 2001:db8:100::/48
R1(config-router-af)#exit-address-family
R1(config-router)#
*Nov 13 22:38:46.975: %BGP-5-ADJCHANGE: neighbor 209.165.200.226 Up
R1(config-router)#
*Nov 13 22:39:26.843: %BGP-5-ADJCHANGE: neighbor 2001:DB8:200::2 Up
R1(config-router)#
*Nov 13 22:40:03.207: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.3 on Ethernet1/1 from LOADING to FULL, Loading Done
R1(config-router)#
*Nov 13 22:41:40.187: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.131 on Ethernet1/2 from LOADING to FULL, Loading Done
R1(config-router)#
*Nov 13 22:41:59.567: %OSPFv3-5-ADJCHG: Process 6, Nbr 0.0.6.131 on Ethernet1/2 from LOADING to FULL, Loading Done
R1(config-router)#
```

FUENTE 35 AUTORIA PROPIA

R3

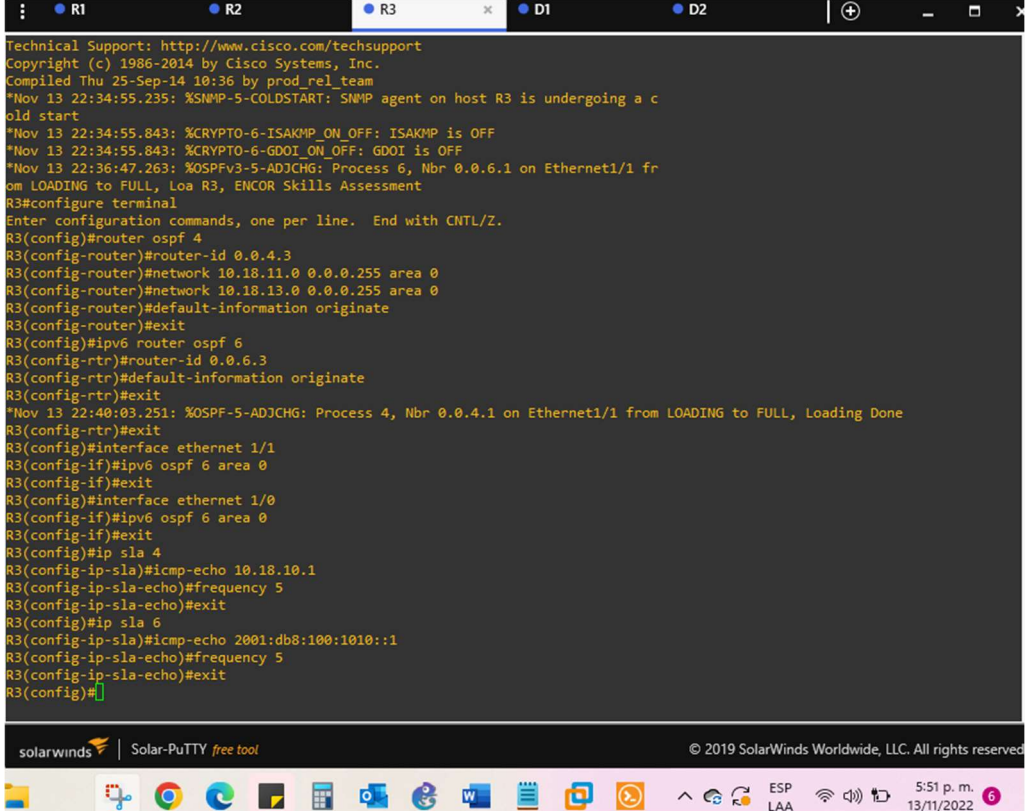
```
router ospf 6// proceso ospf 6
router-id 0.0.4.3// id de R3
network 10.18.11.0 0.0.0.255 area 0//notificacion
network 10.18.13.0 0.0.0.255 area 0//notificacion
default-information originate//rutas por defecto
exit
```

```
ipv6 router ospf 6//proceso ospf 6
router-id 0.0.6.3// id de R3
default-information originate// rutas por defecto
exit
```

```
interface ethernet 1/1// interfaz
ipv6 ospf 6 area 0// interfaz conectada
exit
```

```
interface ethernet 1/0// interfaz
ipv6 ospf 6 area 0// interfaz conectada
exit
```

Ilustración 33 la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv3 R3



```
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Thu 25-Sep-14 10:36 by prod_rel_team
*Nov 13 22:34:55.235: %SNMP-5-COLDSTART: SNMP agent on host R3 is undergoing a c
old start
*Nov 13 22:34:55.843: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Nov 13 22:34:55.843: %CRYPTO-6-GDOI_ON_OFF: GDOI is OFF
*Nov 13 22:36:47.263: %OSPFv3-5-ADJCHG: Process 6, Nbr 0.0.6.1 on Ethernet1/1 fr
om LOADING to FULL, Loa R3, ENCOR Skills Assessment
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 4
R3(config-router)#router-id 0.0.4.3
R3(config-router)#network 10.18.11.0 0.0.0.255 area 0
R3(config-router)#network 10.18.13.0 0.0.0.255 area 0
R3(config-router)#default-information originate
R3(config-router)#exit
R3(config)#ipv6 router ospf 6
R3(config-rtr)#router-id 0.0.6.3
R3(config-rtr)#default-information originate
R3(config-rtr)#exit
*Nov 13 22:40:03.251: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.1 on Ethernet1/1 from LOADING to FULL, Loading Done
R3(config-rtr)#exit
R3(config)#interface ethernet 1/1
R3(config-if)#ipv6 ospf 6 area 0
R3(config-if)#exit
R3(config)#interface ethernet 1/0
R3(config-if)#ipv6 ospf 6 area 0
R3(config-if)#exit
R3(config)#ip sla 4
R3(config-ip-sla)#icmp-echo 10.18.10.1
R3(config-ip-sla-echo)#frequency 5
R3(config-ip-sla-echo)#exit
R3(config)#ip sla 6
R3(config-ip-sla)#icmp-echo 2001:db8:100:1010::1
R3(config-ip-sla-echo)#frequency 5
R3(config-ip-sla-echo)#exit
R3(config)#
```

FUENTE 36 AUTORIA PROPIA

D1

```
router ospf 6//preceso ospf 6
router-id 0.0.4.131//id de d1
network 10.18.100.0 0.0.0.255 area 0//notificacion
network 10.18.101.0 0.0.0.255 area 0//notificacion
network 10.18.102.0 0.0.0.255 area 0//notificacion
network 10.18.10.0 0.0.0.255 area 0//notificacion
passive-interface default//rutas por defecto
no passive-interface ethernet 1/2//interfaz no pasiva
exit
```

```
ipv6 router ospf 6// proceso ospf 6
router-id 0.0.6.131// id de D1
passive-interface default// interfaces pasivas
no passive-interface ethernet 1/2// interfaz no pasiva
exit
```

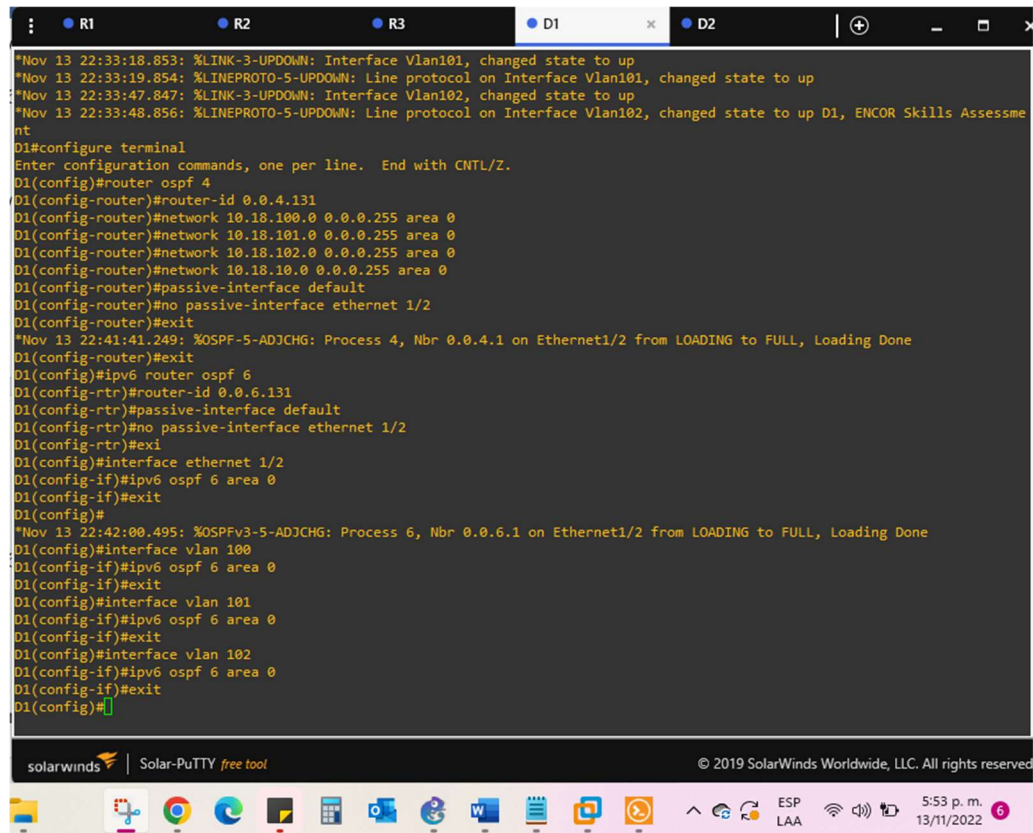
```
interface ethernet 1/2// interfaz
ipv6 ospf 6 area 0// interfaz conectada
exit
```

```
interface vlan 100//interfaz conectada vlan
ipv6 ospf 6 area 0 // interfaz vlan conectada
exit
```

```
interface vlan 101// interfaz vlan conectada
ipv6 ospf 6 area 0 // interfaz vlan conectada
exit
```

```
interface vlan 102// interfaz vlan conectada
ipv6 ospf 6 area 0// interfaz vlan conectada
exit
```

Ilustración 34 la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv3 D1



```
*Nov 13 22:33:18.853: %LINK-3-UPDOWN: Interface Vlan101, changed state to up
*Nov 13 22:33:19.854: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan101, changed state to up
*Nov 13 22:33:47.847: %LINK-3-UPDOWN: Interface Vlan102, changed state to up
*Nov 13 22:33:48.856: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan102, changed state to up
D1, ENCOR Skills Assessment
D1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D1(config)#router ospf 4
D1(config-router)#router-id 0.0.4.131
D1(config-router)#network 10.18.100.0 0.0.0.255 area 0
D1(config-router)#network 10.18.101.0 0.0.0.255 area 0
D1(config-router)#network 10.18.102.0 0.0.0.255 area 0
D1(config-router)#network 10.18.11.0 0.0.0.255 area 0
D1(config-router)#passive-interface default
D1(config-router)#no passive-interface ethernet 1/2
D1(config-router)#exit
*Nov 13 22:41:41.249: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.1 on Ethernet1/2 from LOADING to FULL, Loading Done
D1(config-router)#exit
D1(config)#ipv6 router ospf 6
D1(config-rtr)#router-id 0.0.6.131
D1(config-rtr)#passive-interface default
D1(config-rtr)#no passive-interface ethernet 1/2
D1(config-rtr)#exit
D1(config)#interface ethernet 1/2
D1(config-if)#ipv6 ospf 6 area 0
D1(config-if)#exit
D1(config)#
*Nov 13 22:42:00.495: %OSPFv3-5-ADJCHG: Process 6, Nbr 0.0.6.1 on Ethernet1/2 from LOADING to FULL, Loading Done
D1(config)#interface vlan 100
D1(config-if)#ipv6 ospf 6 area 0
D1(config-if)#exit
D1(config)#interface vlan 101
D1(config-if)#ipv6 ospf 6 area 0
D1(config-if)#exit
D1(config)#interface vlan 102
D1(config-if)#ipv6 ospf 6 area 0
D1(config-if)#exit
D1(config)#
```

FUENTE 37 AUTORIA PROPIA

D2

```
router ospf 4// proceso ospf 6
router-id 0.0.4.132// id de D2
network 10.18.100.0 0.0.0.255 area 0// notificacion
network 10.18.101.0 0.0.0.255 area 0// notificacion
network 10.18.102.0 0.0.0.255 area 0// notificacion
network 10.18.11.0 0.0.0.255 area 0// notificacion
passive-interface default// rutas por defecto
no passive-interface ethernet 1/0// intefaz no pasivas
exit
```

```
ipv6 router ospf 6// proceso ospf 6
router-id 0.0.6.132// id de D1
passive-interface default // interfaces pasivas
no passive-interface ethernet 1/0 // intefaz no pasiva
exit
```

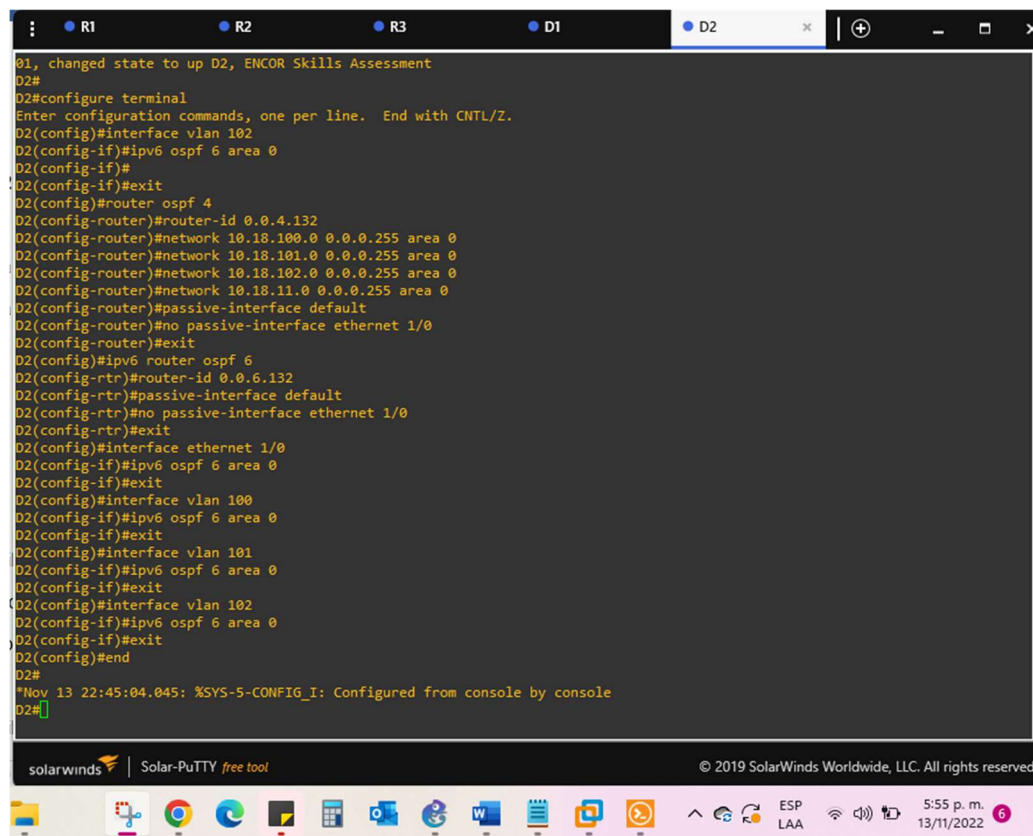
```
interface ethernet 1/0// interfaz
ipv6 ospf 6 area 0// interfaz conectada
exit
```

```
interface vlan 100// vlan conectada
ipv6 ospf 6 area 0// interfaz conectada
exit
```

```
interface vlan 101// interfaz conectada
ipv6 ospf 6 area 0// interfaz conectada
exit
```

```
interface vlan 102// interfaz vlan conecta
ipv6 ospf 6 area 0// interfaz conectada
exit
end
```

Ilustración 35 la "Red de la empresa" (es decir, R1, R3, D1 y D2), configure OSPFv3 D2



```
R1 R2 R3 D1 D2
01, changed state to up D2, ENCOR Skills Assessment
D2#
D2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
D2(config)#interface vlan 102
D2(config-if)#ipv6 ospf 6 area 0
D2(config-if)#
D2(config-if)#exit
D2(config)#router ospf 4
D2(config-router)#router-id 0.0.4.132
D2(config-router)#network 10.18.100.0 0.0.0.255 area 0
D2(config-router)#network 10.18.101.0 0.0.0.255 area 0
D2(config-router)#network 10.18.102.0 0.0.0.255 area 0
D2(config-router)#network 10.18.11.0 0.0.0.255 area 0
D2(config-router)#passive-interface default
D2(config-router)#no passive-interface ethernet 1/0
D2(config-router)#exit
D2(config)#ipv6 router ospf 6
D2(config-rtr)#router-id 0.0.6.132
D2(config-rtr)#passive-interface default
D2(config-rtr)#no passive-interface ethernet 1/0
D2(config-rtr)#exit
D2(config)#interface ethernet 1/0
D2(config-if)#ipv6 ospf 6 area 0
D2(config-if)#exit
D2(config)#interface vlan 100
D2(config-if)#ipv6 ospf 6 area 0
D2(config-if)#exit
D2(config)#interface vlan 101
D2(config-if)#ipv6 ospf 6 area 0
D2(config-if)#exit
D2(config)#interface vlan 102
D2(config-if)#ipv6 ospf 6 area 0
D2(config-if)#exit
D2(config)#end
D2#
*Nov 13 22:45:04.045: %SYS-5-CONFIG_I: Configured from console by console
D2#
```

FUENTE 38 AUTORIA PROPIA

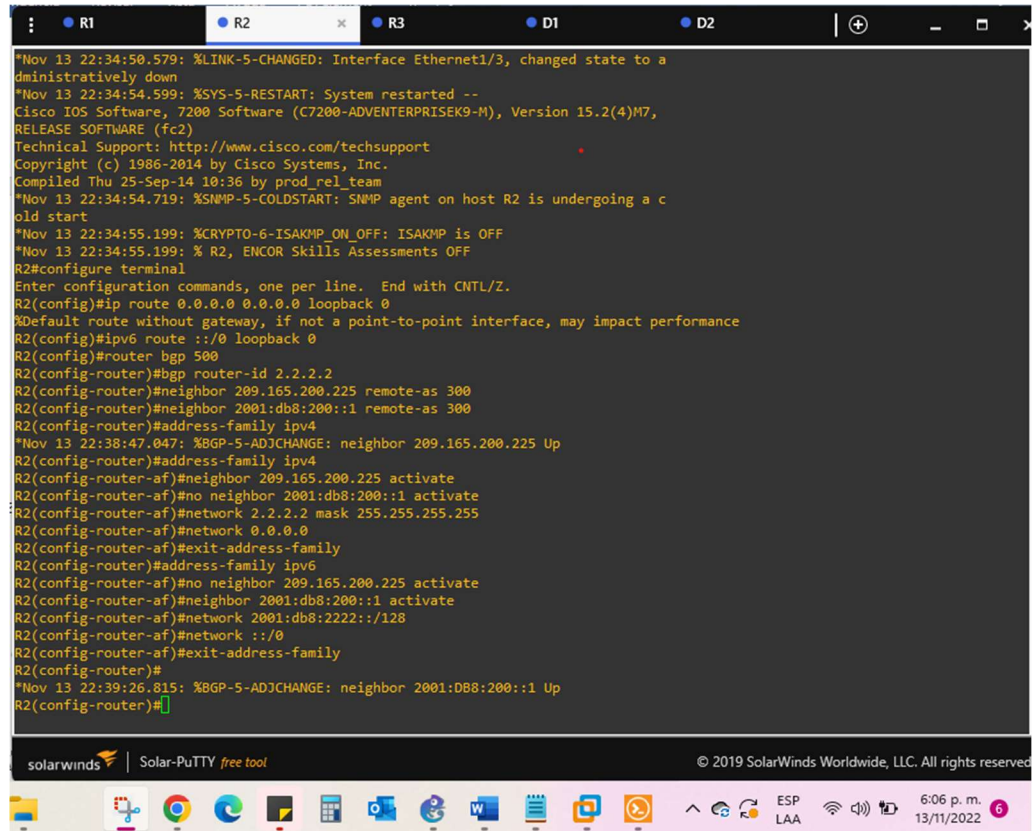
3.3 En R2 en la "Red ISP", configure MP-BGP

R2

```
ip route 0.0.0.0 0.0.0.0 loopback 0// ruta ipv4
ipv6 route ::/0 loopback 0// ruta ipv6
router bgp 500//configuracion router
bgp router-id 2.2.2.2//id enrutador
neighbor 209.165.200.225 remote-as 300// vecino ipv4 R1
neighbor 2001:db8:200::1 remote-as 300// vecino ipv4 R1
address-family ipv4// familia ipv4
neighbor 209.165.200.225 activate// activar vecino
no neighbor 2001:db8:200::1 activate//desactivar vecino
network 2.2.2.2 mask 255.255.255.255//loopback
network 0.0.0.0// ruta
exit-address-family// salida
```

```
address-family ipv6// direccion ipv6
no neighbor 209.165.200.225 activate// desactivar vecino
neighbor 2001:db8:200::1 activate//activar vecino
network 2001:db8:2222::/128// loopback
network ::/0//ruta
exit-address-family// salida
```

Ilustración 36 R2 en la "Red ISP", configure MP-BGP R2



```
*Nov 13 22:34:50.579: %LINK-5-CHANGED: Interface Ethernet1/3, changed state to a
dministratively down
*Nov 13 22:34:54.599: %SYS-5-RESTART: System restarted --
Cisco IOS Software, 7200 Software (C7200-ADVENTERPRISEK9-M), Version 15.2(4)M7,
RELEASE SOFTWARE (fc2)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Thu 25-Sep-14 10:36 by prod_rel_team
*Nov 13 22:34:54.719: %SNMP-5-COLDSTART: SNMP agent on host R2 is undergoing a c
old start
*Nov 13 22:34:55.199: %CRYPTO-6-ISAKMP_ON_OFF: ISAKMP is OFF
*Nov 13 22:34:55.199: % R2, ENCOR Skills Assessments OFF
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip route 0.0.0.0 0.0.0.0 loopback 0
%Default route without gateway, if not a point-to-point interface, may impact performance
R2(config)#ipv6 route ::0 loopback 0
R2(config)#router bgp 500
R2(config-router)#bgp router-id 2.2.2.2
R2(config-router)#neighbor 209.165.200.225 remote-as 300
R2(config-router)#neighbor 2001:db8:200::1 remote-as 300
R2(config-router)#address-family ipv4
*Nov 13 22:38:47.047: %BGP-5-ADJCHANGE: neighbor 209.165.200.225 Up
R2(config-router)#address-family ipv4
R2(config-router-af)#neighbor 209.165.200.225 activate
R2(config-router-af)#no neighbor 2001:db8:200::1 activate
R2(config-router-af)#network 2.2.2.2 mask 255.255.255.255
R2(config-router-af)#network 0.0.0.0
R2(config-router-af)#exit-address-family
R2(config-router)#address-family ipv6
R2(config-router-af)#no neighbor 209.165.200.225 activate
R2(config-router-af)#neighbor 2001:db8:200::1 activate
R2(config-router-af)#network 2001:db8:2222::/128
R2(config-router-af)#network ::0
R2(config-router-af)#exit-address-family
R2(config-router)#
*Nov 13 22:39:26.815: %BGP-5-ADJCHANGE: neighbor 2001:DB8:200::1 Up
R2(config-router)#
```

FUENTE 39 AUTORIA PROPIA

3.4 En R1 en la "Red ISP", configurar MP-BGP Configure dos rutas resumidas estáticas a la interfaz Null 0:

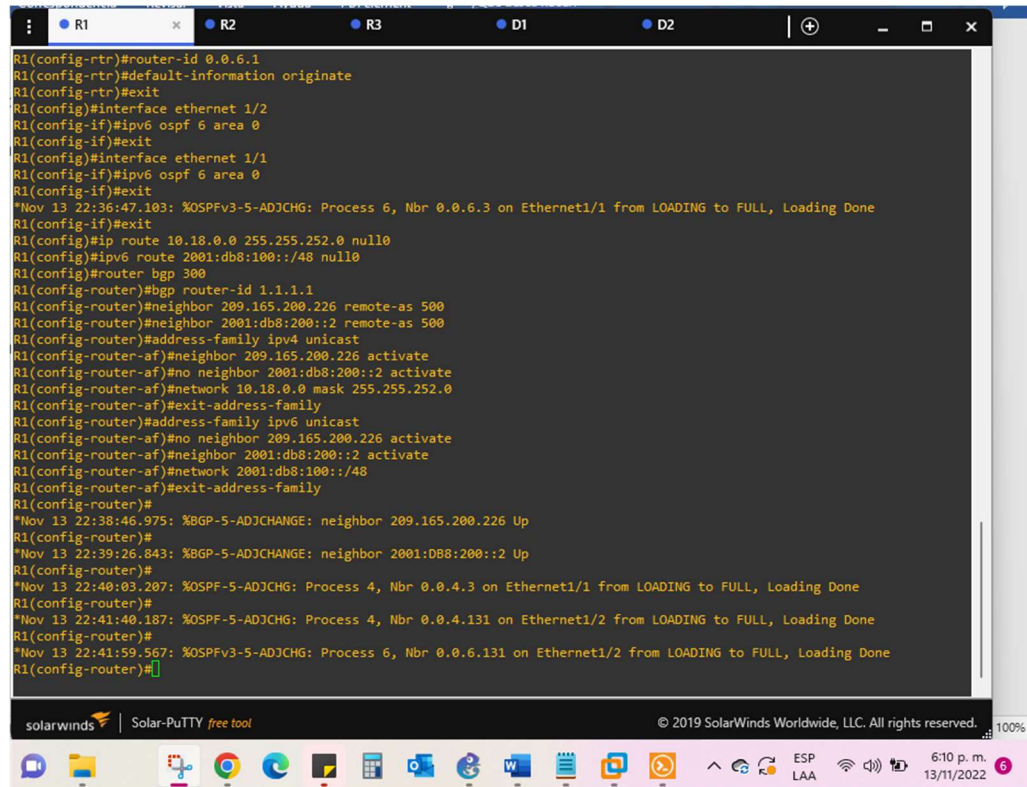
R1:

```
ip route 10.18.0.0 255.255.252.0 null0// ruta ipv4
ipv6 route 2001:db8:100::/48 null0// ruta ipv6
router bgp 300// router
bgp router-id 1.1.1.1// enrutador
neighbor 209.165.200.226 remote-as 500// vecino ipv4
neighbor 2001:db8:200::2 remote-as 500// vecino ipv6
address-family ipv4 unicast// direccionamiento ipv4
neighbor 209.165.200.226 activate// activar vecino
no neighbor 2001:db8:200::2 activate//desactivar vecino
network 10.18.0.0 mask 255.255.252.0// loopback
exit-address-family//salida
```

```
address-family ipv6 unicast// direcciones ipv6
no neighbor 209.165.200.226 activate// no activar vecino
```

neighbor 2001:db8:200::2 activate // activar vecino
network 2001:db8:100::/48 // loopback
exit-address-family // salida

Ilustración 37 MP-BGP Configure dos rutas resumidas estáticas a la interfaz Null 0: R1



```
R1(config-rtr)#router-id 0.0.6.1
R1(config-rtr)#default-information originate
R1(config-rtr)#exit
R1(config)#interface ethernet 1/2
R1(config-if)#ipv6 ospf 6 area 0
R1(config-if)#exit
R1(config)#interface ethernet 1/1
R1(config-if)#ipv6 ospf 6 area 0
R1(config-if)#exit
*Nov 13 22:36:47.103: %OSPFv3-5-ADJCHG: Process 6, Nbr 0.0.6.3 on Ethernet1/1 from LOADING to FULL, Loading Done
R1(config-if)#exit
R1(config)#ip route 10.18.0.0 255.255.252.0 null0
R1(config)#ipv6 route 2001:db8:100::/48 null0
R1(config)#router bgp 300
R1(config-router)#bgp router-id 1.1.1.1
R1(config-router)#neighbor 209.165.200.226 remote-as 500
R1(config-router)#neighbor 2001:db8:200::2 remote-as 500
R1(config-router)#address-family ipv4 unicast
R1(config-router-af)#neighbor 209.165.200.226 activate
R1(config-router-af)#no neighbor 2001:db8:200::2 activate
R1(config-router-af)#network 10.18.0.0 mask 255.255.252.0
R1(config-router-af)#exit-address-family
R1(config-router)#address-family ipv6 unicast
R1(config-router-af)#no neighbor 209.165.200.226 activate
R1(config-router-af)#neighbor 2001:db8:200::2 activate
R1(config-router-af)#network 2001:db8:100::/48
R1(config-router-af)#exit-address-family
R1(config-router)#
*Nov 13 22:38:46.975: %BGP-5-ADJCHANGE: neighbor 209.165.200.226 Up
R1(config-router)#
*Nov 13 22:39:26.843: %BGP-5-ADJCHANGE: neighbor 2001:DB8:200::2 Up
R1(config-router)#
*Nov 13 22:40:03.207: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.3 on Ethernet1/1 from LOADING to FULL, Loading Done
R1(config-router)#
*Nov 13 22:41:40.187: %OSPF-5-ADJCHG: Process 4, Nbr 0.0.4.131 on Ethernet1/2 from LOADING to FULL, Loading Done
R1(config-router)#
*Nov 13 22:41:59.567: %OSPFv3-5-ADJCHG: Process 6, Nbr 0.0.6.131 on Ethernet1/2 from LOADING to FULL, Loading Done
R1(config-router)#
```

FUENTE 40 AUTORIA PROPIA

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

D1:
ip sla 4 //Se crea Sla 4
icmp-echo 10.18.10.1 //Prueba de disponibilidad
frequency 5 //frecuencia 5 segundos
exit

ip sla 6 //ip Sla 6
icmp-echo 2001:db8:100:1010::1 //disponibilidad
frequency 5 // frecuencia 5 segundos
exit

ip sla schedule 4 life forever start-time now //tiempo de termino
ip sla schedule 6 life-forever start-time now //tiempo de termino
track 4 ip sla 4 //IP SLA de IP SLA 4

```

delay down 10 up 15 //retardo
exit
track 6 ip sla 6 //IP SLA de IP SLA 6
delay down 10 up 15//retardo
exit

```

Ilustración 38 IP SLA que prueben la accesibilidad de la interfaz E1/2 de R1 D1

```

D1(config)#interface vlan 100
D1(config-if)#standby version 2
D1(config-if)#standby 104 ip 10.18.100.254
D1(config-if)#standby 104 priority 150
D1(config-if)#standby 104 preempt
D1(config-if)#standby 104 track 4 decrement 60
D1(config-if)#standby 106 ipv6 autoconfig
D1(config-if)#standby 106 priority 150
D1(config-if)#standby 106 preempt
D1(config-if)#standby 106 track 6 decrement 60
D1(config-if)#exit
D1(config)#interface vlan 101
D1(config-if)#standby version 2
D1(config-if)#standby 114 ip 10.18.101.254
D1(config-if)#standby 114 preempt
D1(config-if)#standby 114 track 4 decrement 60
D1(config-if)#standby 116 ipv6 autoconfig
D1(config-if)#standby 116 preempt
D1(config-if)#standby 116 track 6 decrement 60
D1(config-if)#exit
*Nov 13 23:04:50.705: %HSRP-5-STATECHANGE: Vlan100 Grp 106 state Standby -> Active
*Nov 13 23:04:51.453: %HSRP-5-STATECHANGE: Vlan100 Grp 104 state Standby -> Active
D1(config-if)#exit
*Nov 13 23:05:07.708: %HSRP-5-STATECHANGE: Vlan101 Grp 114 state Standby -> Active
D1(config-if)#exit
D1(config)#
*Nov 13 23:05:08.958: %HSRP-5-STATECHANGE: Vlan101 Grp 116 state Standby -> Active
D1(config)#interface vlan 102
D1(config-if)#standby version 2
D1(config-if)#standby 124 ip 10.18.102.254
D1(config-if)#standby 124 priority 150
D1(config-if)#standby 124 preempt
D1(config-if)#standby 124 track 4 decrement 60
D1(config-if)#standby 126 ipv6 autoconfig
D1(config-if)#standby 126 priority 150
D1(config-if)#standby 126 preempt
D1(config-if)#standby 126 track 6 decrement 60
D1(config-if)#exit

```

FUENTE 41 AUTORIA PROPIA

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

```

D2:
ip sla 4 // Sla 4
icmp-echo 10.18.11.1//disponibilidad
frequency 5//frecuencia cada 5 segundos
exit

```

```

ip sla 6 // Sla 6
icmp-echo 2001:db8:100:1011::1 //disponibilidad
frequency 5 //frecuencia cada 5 segundos
exit

```

```

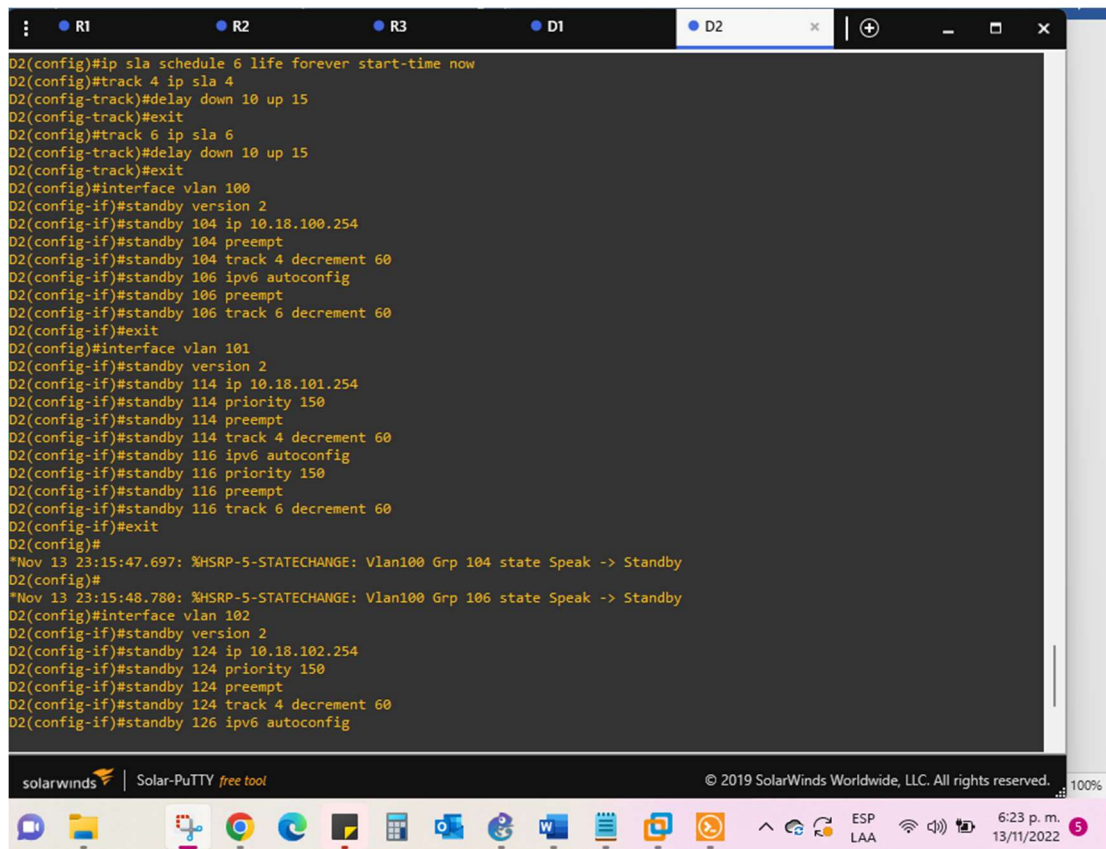
ip sla schedule 4 life forever start-time now // tiempo de termino

```

```
ip sla schedule 6 life-forever start-time now // tiempo de termino
track 4 ip sla 4 //IP SLA de IP SLA 4
delay down 10 up 15 // retardo
exit
```

```
track 6 ip sla 6 //IP SLA de IP SLA 6
delay down 10 up 15 //retardo
exit
```

Ilustración 39 D1, configure HSRPv2 D1



```
D2(config)#ip sla schedule 6 life forever start-time now
D2(config)#track 4 ip sla 4
D2(config-track)#delay down 10 up 15
D2(config-track)#exit
D2(config)#track 6 ip sla 6
D2(config-track)#delay down 10 up 15
D2(config-track)#exit
D2(config)#interface vlan 100
D2(config-if)#standby version 2
D2(config-if)#standby 104 ip 10.18.100.254
D2(config-if)#standby 104 preempt
D2(config-if)#standby 104 track 4 decrement 60
D2(config-if)#standby 106 ipv6 autoconfig
D2(config-if)#standby 106 preempt
D2(config-if)#standby 106 track 6 decrement 60
D2(config-if)#exit
D2(config)#interface vlan 101
D2(config-if)#standby version 2
D2(config-if)#standby 114 ip 10.18.101.254
D2(config-if)#standby 114 priority 150
D2(config-if)#standby 114 preempt
D2(config-if)#standby 114 track 4 decrement 60
D2(config-if)#standby 116 ipv6 autoconfig
D2(config-if)#standby 116 priority 150
D2(config-if)#standby 116 preempt
D2(config-if)#standby 116 track 6 decrement 60
D2(config-if)#exit
D2(config)#
*Nov 13 23:15:47.697: %HSRP-5-STATECHANGE: Vlan100 Grp 104 state Speak -> Standby
D2(config)#
*Nov 13 23:15:48.780: %HSRP-5-STATECHANGE: Vlan100 Grp 106 state Speak -> Standby
D2(config)#interface vlan 102
D2(config-if)#standby version 2
D2(config-if)#standby 124 ip 10.18.102.254
D2(config-if)#standby 124 priority 150
D2(config-if)#standby 124 preempt
D2(config-if)#standby 124 track 4 decrement 60
D2(config-if)#standby 126 ipv6 autoconfig
```

FUENTE 42 AUTORIA PROPIA

4.3 En D1, configure HSRPv2

D1:

```
interface vlan 100 // interfaz vlan 100
standby version 2 //versión 2 de HSRP
standby 104 ip 10.18.100.25 //Asigne de dirección IP virtual
standby 104 priority 15 //prioridad del grupo en 150
standby 104 preempt //Habilitacion de preferencia
standby 104 track 4 decrement 60 //objeto 4 se disminuya en 60.
standby 106 ipv6 autoconfig//dirección IP virtual automática de ipv6
standby 106 priority 15 //grupo en 150
```

```
standby 106 preempt //Habilitacion de preferencia
standby 106 track 6 decrement 60 //objeto 6 y disminuya en 60
exit
```

```
interface vlan 101 // interfaz vlan 101
standby version 2 //versión 2 de HSRP
standby 114 ip 10.18.101.254 //dirección IP virtual
standby 14 preempt //Habilitacion de preferencia
standby 114 track 4 decrement 60 //objeto 4 y disminuya en 60.
standby 116 ipv6 autoconfig //dirección IP virtual automática de ipv6
standby 116 preempt //Habilitacion de preferencia
standby 116 track 6 decrement 60 //objeto 6 y disminuya en 60
exit
```

```
interface vlan 102 //interfaz vlan 102
standby version 2 //versión 2 de HSRP
standby 124 ip 10.18.102.254 // dirección IP virtual
standby 124 priority 15 //prioridad del grupo en 150
standby 124 preempt //Habilitacion de preferencia
standby 124 track 4 decrement 60 //objeto 4 y disminuya en 60.
standby 126 ipv6 autoconfig //dirección IP virtual automática de ipv6
standby 126 priority 150//grupo en 150
standby 126 preempt//Habilitacion de preferencia
standby 126 track 6 decrement 60 // objeto 6 y disminuya en 60
exit
```

Ilustración 40 configure HSRPv2

```
*Nov 13 23:04:01.262: %TRACKING-5-STATE: 4 ip sla 4 state Down->Up
D1(config-track)#exit
D1(config)#interface vlan 100
D1(config-if)#standby version 2
D1(config-if)#standby 104 ip 10.18.100.254
D1(config-if)#standby 104 priority 150
D1(config-if)#standby 104 preempt
D1(config-if)#standby 104 track 4 decrement 60
D1(config-if)#standby 106 ipv6 autoconfig
D1(config-if)#standby 106 priority 150
D1(config-if)#standby 106 preempt
D1(config-if)#standby 106 track 6 decrement 60
D1(config-if)#exit
D1(config)#interface vlan 101
D1(config-if)#standby version 2
D1(config-if)#standby 114 ip 10.18.101.254
D1(config-if)#standby 114 preempt
D1(config-if)#standby 114 track 4 decrement 60
D1(config-if)#standby 116 ipv6 autoconfig
D1(config-if)#standby 116 preempt
D1(config-if)#standby 116 track 6 decrement 60
D1(config-if)#exit
*Nov 13 23:04:50.705: %HSRP-5-STATECHANGE: Vlan100 Grp 106 state Standby -> Active
*Nov 13 23:04:51.453: %HSRP-5-STATECHANGE: Vlan100 Grp 104 state Standby -> Active
D1(config-if)#exit
*Nov 13 23:05:07.708: %HSRP-5-STATECHANGE: Vlan101 Grp 114 state Standby -> Active
D1(config-if)#exit
D1(config)#
*Nov 13 23:05:08.958: %HSRP-5-STATECHANGE: Vlan101 Grp 116 state Standby -> Active
D1(config)#interface vlan 102
D1(config-if)#standby version 2
D1(config-if)#standby 124 ip 10.18.102.254
D1(config-if)#standby 124 priority 150
D1(config-if)#standby 124 preempt
D1(config-if)#standby 124 track 4 decrement 60
D1(config-if)#standby 126 ipv6 autoconfig
D1(config-if)#standby 126 priority 150
D1(config-if)#standby 126 preempt
```

FUENTE 43 AUTORIA PROPIA

4.4 D2, configure HSRPv2

D1:

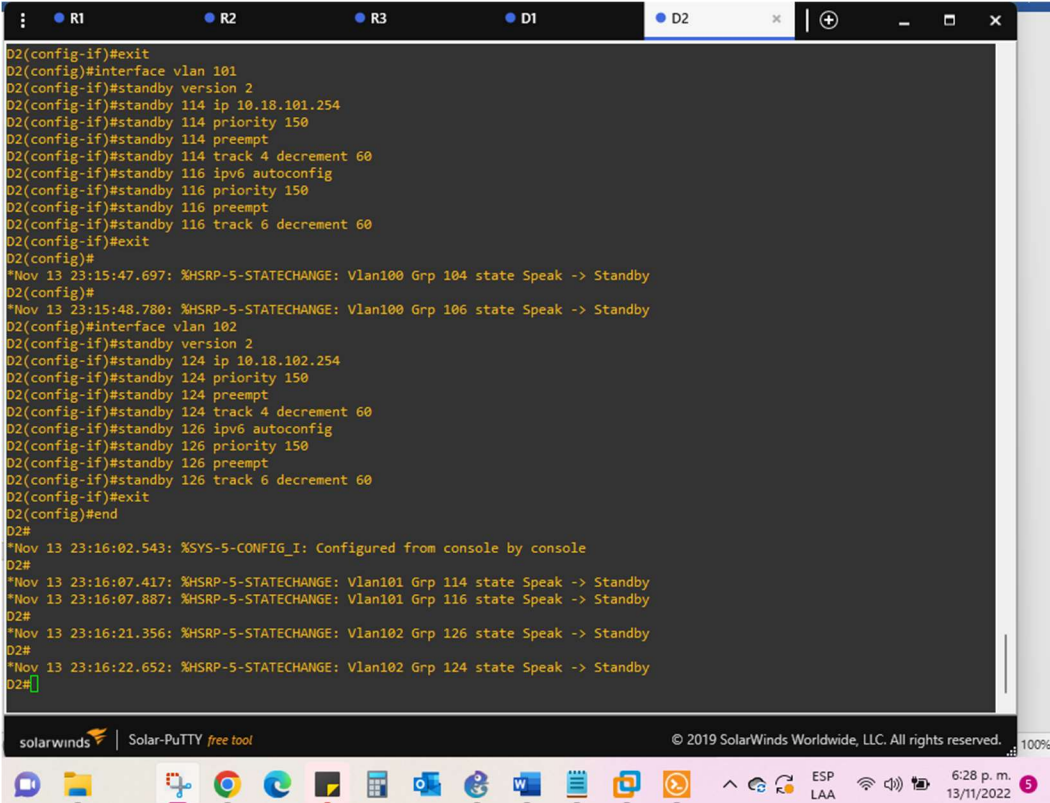
```
interface vlan 100 // interfaz vlan 100
standby version 2 //versión 2 de HSRP
standby 104 ip 10.18.100.25 //dirección IP virtual
standby 104 preempt //Habilitacion de preferencia
standby 104 track 4 decrement 60 //objeto 4 y disminuya en 60.
standby 106 ipv6 autoconfig //Asigne la dirección IP virtual automática de ipv6
standby 106 preempt //Habilitacion de preferencia
standby 106 track 6 decrement 60 //objeto 6 y disminuya en 60
exit
```

```
interface vlan 101 //interfaz vlan 101
standby version 2 //versión 2 de HSRP
standby 114 ip 10.18.101.254 // dirección IP virtual
standby 114 priority 150 //grupo en 150
standby 114 preempt //Habilitacion de preferencia
standby 114 track 4 decrement 60 //objeto 4 y disminuya en 60.
```

```
standby 116 ipv6 autoconfig //dirección IP virtual automática de ipv6
standby 116 priority 150 //grupo en 150
standby 116 preempt//Habilitacion de preferencia
standby 116 track 6 decrement 60 //objeto 6 y disminuya en 60
exit
```

```
interface vlan 102 //interfaz vlan 102
standby version 2 //versión 2 de HSRP
standby 124 ip 10.18.102.254 //dirección IP virtual
standby 124 priority 150 //grupo en 150
standby 124 preempt //Habilitacion de preferencia
standby 124 track 4 decrement 60 //objeto 4 y disminuya en 60.
standby 126 ipv6 autoconfig// dirección IP virtual automática de ipv6
standby 126 priority 150 //grupo en 150
standby 126 preempt //Habilitacion de preferencia
standby 126 track 6 decrement 60 //objeto 6 y disminuya en 60
exit
```

Ilustración 41 D2, configure HSRPv2 D2



```
D2(config-if)#exit
D2(config)#interface vlan 101
D2(config-if)#standby version 2
D2(config-if)#standby 114 ip 10.18.101.254
D2(config-if)#standby 114 priority 150
D2(config-if)#standby 114 preempt
D2(config-if)#standby 114 track 4 decrement 60
D2(config-if)#standby 116 ipv6 autoconfig
D2(config-if)#standby 116 priority 150
D2(config-if)#standby 116 preempt
D2(config-if)#standby 116 track 6 decrement 60
D2(config-if)#exit
D2(config)#
*Nov 13 23:15:47.697: %HSRP-5-STATECHANGE: Vlan100 Grp 104 state Speak -> Standby
D2(config)#
*Nov 13 23:15:48.780: %HSRP-5-STATECHANGE: Vlan100 Grp 106 state Speak -> Standby
D2(config)#interface vlan 102
D2(config-if)#standby version 2
D2(config-if)#standby 124 ip 10.18.102.254
D2(config-if)#standby 124 priority 150
D2(config-if)#standby 124 preempt
D2(config-if)#standby 124 track 4 decrement 60
D2(config-if)#standby 126 ipv6 autoconfig
D2(config-if)#standby 126 priority 150
D2(config-if)#standby 126 preempt
D2(config-if)#standby 126 track 6 decrement 60
D2(config-if)#exit
D2(config)#end
D2#
*Nov 13 23:16:02.543: %SYS-5-CONFIG_I: Configured from console by console
D2#
*Nov 13 23:16:07.417: %HSRP-5-STATECHANGE: Vlan101 Grp 114 state Speak -> Standby
*Nov 13 23:16:07.887: %HSRP-5-STATECHANGE: Vlan101 Grp 116 state Speak -> Standby
D2#
*Nov 13 23:16:21.356: %HSRP-5-STATECHANGE: Vlan102 Grp 126 state Speak -> Standby
D2#
*Nov 13 23:16:22.652: %HSRP-5-STATECHANGE: Vlan102 Grp 124 state Speak -> Standby
D2#
```

FUENTE 44 AUTORIA PROPIA

CONCLUSIONES

Se realiza de manera satisfactoria las practicas planteadas en el escenario 1, y en el escenario 2, mediante la herramienta GNS3 realizamos la configuracion de los dispositivos desde la creacion de la topologia que se tenia que implementar, se realiza configuracion de interfaces en varias capaz se toma evidencia de lo trabajado.

El protoco VLAN son utilizado para administrar para configurar los dispositivos, de la marca Cisco en VLAN de forma en el switch de la marca permite intercambio de informacion en el punto central, se crea ips SLA que prueba la accesibilidad de la interfaz R1, es importante acotar la practicas realizadas como la configuracion HSRPV2, se configuro el grupo 104 HSRP de ipv4 para VLAN 100, Se realizaron la asignacion la ip virtual, se establece la prioridad de grupo 150, se configuro el grupo 114 de HSRP de ipv4 para VLAN 101, se configuro el grupo 124 en ipv4 para VLAN 102.

Para concluir en la actividad realizada se implemento conmutacion STP, configuracion de vlans, aplicación y ejecucion de protocolos de enrutamiento avanzado OSPFV3 y bgp, multidifusion de calidad de servicio, Fue muy satisfactorio todo lo aprendido en este diplomado y mas con estas prueba de habilidades donde todos los conocimiento aprendidos y fuer aplicado en un entorno muy similar a que se puede encontrar en la industria. Fue muy satisfactorio todo lo aprendido en este diplomado y mas con estas prueba de habilidades donde todos los conocimiento aprendidos y fuer aplicado en un entorno muy similar a que se puede encontrar en la industria.

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Edgeworth, B., Garza Rios, B., Gooley, J., Hucaby, D. (2020). "CISCO Press (Ed). Spanning Tree Protocol. CCNP and CCIE Enterprise Core ENCOR 350-401". {En línea}. {09 de septiembre de 2022}. Disponible en: <https://1drv.ms/b/s!AAIGq5JUgUBthk8>

ANEXOS

ANEXOS 1

https://1drv.ms/u/s!Alw4aDIB1IDfjkiwrxZa7_dPJKqI?e=2BAgCl