DIPLOMADO DE PROFUNDIZACIÓN CISCO CCNP PRUEBA DE HABILIDADES PRÁCTICA ESENARIOS SIMULADOS

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI INGENIERÍA ELECTRÓNICA VALLEDUPAR 2022

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Diplomado de opción de grado presentado para optar el título de INGENIERO ELECTRÓNICO

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NOTA DE ACEPTACIÓN:

Presidente del Jurado

Jurado

Jurado

23 de Noviembre del 2022

AGRADECIMIENTOS

Mi agradecimiento en primera instancia es a Dios por brindarme sabiduría y salud para desarrollar todas mis actividades; en segunda instancia a mi familia motor de todos mis proyecto. Por ultimo; al alma mater la Universidad Nacional Abierta y a Distancia UNAD por mi formación con ayuda de los docentes y compañeros quienes han enriquecido mis conocimientos.

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GLOSARIO

VLANs: (redes de área local virtuales) pueden considerarse como dominios de difusión lógica. Una VLAN divide los grupos de usuarios de la red de una red física real en segmentos de redes lógicas.

CISCO PACKET TRACER: Es un poderoso programa de simulación de red que permite a los estudiantes experimentar con el comportamiento de la red. Como parte integral de la experiencia de aprendizaje integral de Networking Academy, Packet Tracer proporciona capacidades de simulación, visualización, autoría, evaluación y colaboración, y facilita la enseñanza y el aprendizaje de conceptos tecnológicos complejos.

SWITCH: Es un dispositivo de interconexión utilizado para conectar equipos en red formando lo que se conoce como una red de área local (LAN) y cuyas especificaciones técnicas siguen el estándar conocido como Ethernet (o técnicamente IEEE 802.3).

ROUTER: Un router es un dispositivo que ofrece una conexión Wi-Fi, que normalmente está conectado a un módem y que envía información de Internet a tus dispositivos personales, como ordenadores, teléfonos o tablets. Los dispositivos que están conectados a Internet en tu casa conforman tu red de área local (LAN).

RED: Es un conjunto de dispositivos interconectados entre sí a través de un medio, que intercambian información y comparten recursos

PROTOCOLO: Es un conjunto formal de estándares y normas que rigen tanto el formato como el control de la interacción entre los diferentes dispositivos dentro de una red o sistema de comunicación, permitiendo así que puedan transmitir datos entre ellos.

RESUMEN

En el presente documento escrito se plama una simulacion del paso dos donde se practican los comandos de la configuración de cada uno de los protocolos.

En los presente escenarios se configuran los routers según lo planteado en cada actividad y se verifican estas configuraciones mediante el uso de los comandos show ip route. Donde se estructurar redes conmutadas mediante el uso del protocolo e implementación de servicios IP con calidad de servicio en ambientes de red empresariales LAN y protocolo STP

Palabras clave: Cisco, switch, router, protocolo, VLANs

ABSTRACT

In this written document, a simulation of step two is planned, where the configuration commands of each of the protocols are practiced.

In these scenarios, the routers are configured as proposed in each activity and these configurations are verified by using the show ip route commands. Where switched networks are structured through the use of the protocol and implementation of IP services with quality of service in business network environments LAN and STP protocol

Keywords: Cisco, switch, router, protocol, VLANs

INTRODUCCIÓN

Las telecomunicaciones como herramienta para la competitividad global con visión sociohumanística), donde los estudiantes recibirán la formación necesaria para crear una red empresarial eficaz y escalable; así como a instalar, configurar, supervisar, y solucionar problemas en los equipos pertenecientes a la infraestructura de una red multipropósito y multiplataforma.

El Diplomado Cisco CCNP (Cisco Certified Networking Professional / Profesional en Redes certificado por Cisco) permite desarrollar la capacidad de planificar, implementar, verificar y solucionar problemas de redes empresariales locales y de área amplia y trabajar en colaboración con especialistas en soluciones avanzadas de seguridad, voz, redes inalámbricas y video.

En el Paso 6 se evidenciará la configuración de redes conmutada, para comprender las características de una infraestructura de red jerárquica convergente. De igual forma; se diseñar soluciones de red escalables mediante la configuración básica y avanzada de protocolos de enrutamiento para la implementación de servicios IP con calidad de servicio en ambientes de red empresariales LAN y WAN.

ESCENARIO 1.

Topología de la red propuesta para el escenario 1.

Lab - Implement BGP Communities



Addressing Table

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link- Local
R1	E1/0	209.165.200.225 /27	2001:db8:200::1/64	fe80::1:1
	E1/2	10.27.10.1/24	2001:db8:100:1010::1/ 64	fe80::1:2
	E1/1	10.27.13.1/24	2001:db8:100:1013::1/ 64	fe80::1:3
R2	E1/0	209.165.200.226 /27	2001:db8:200::2/64	fe80::2:1
	Loopback0	2.2.2.2/32	2001:db8:2222::1/128	fe80::2:3
R3	E1/0	10. 27.11.1/24	2001:db8:100:1011::1/ 64	fe80::3:2

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link- Local
	E1/1	10.27.13.3/24	2001:db8:100:1013::3/ 64	fe80::3:3
D1	E1/2	10.27.10.2/24	2001:db8:100:1010::2/ 64	fe80::d1:1
	VLAN 100	10.27.100.1/24	2001:db8:100:100::1/6 4	fe80::d1:2
	VLAN 101	10. 27.101.1/24	2001:db8:100:101::1/6 4	fe80::d1:3
	VLAN 102	10.27.102.1/24	2001:db8:100:102::1/6 4	fe80::d1:4
D2	E1/0	10.27.11.2/24	2001:db8:100:1011::2/ 64	fe80::d2:1
	VLAN 100	10.27.100.2/24	2001:db8:100:100::2/6 4	fe80::d2:2
	VLAN 101	10.27.101.2/24	2001:db8:100:101::2/6 4	fe80::d2:3
	VLAN 102	10.27.102.2/24	2001:db8:100:102::2/6 4	fe80::d2:4
A1	VLAN 100	10.27.100.3/23	2001:db8:100:100::3/6 4	fe80::a1:1
PC1	NIC	10.27.100.5/24	2001:db8:100:100::5/6 4	EUI-64
PC2	NIC	DHCP	SLAAC	EUI-64
PC3	NIC	DHCP	SLAAC	EUI-64
PC4	NIC	10.27.100.6/24	2001:db8:100:100::6/6 4	EUI-64

Objectives

Part 1: Build the Network and Configure Basic Device Settings and Interface Addressing

Part 2: Configure the Layer 2 Network and Host Support

Part 3: Configure Routing Protocols

Part 4: Configure First-Hop Redundancy

Background / Scenario

In this skills assessment, you are responsible for completing the configuration of the network so there is full end-to-end reachability, so the hosts have reliable default gateway support, and so that management protocols are operational within the "Company Network" part of the topology. Be careful to verify that your configurations meet the provided specifications and that the devices perform as required.

Note: The routers used with CCNP hands-on labs are Cisco 7200 routers. The switches used in the labs are Cisco Catalyst L2 switches Other routers, switches, and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and the output produced might vary from what is shown in the labs.

Note: Make sure that the switches have been erased and have no startup configurations. If you are unsure, contact your instructor.

Note: The letters "X, Y" represent the last two digits of your ID number (cédula).

Required Resources

- 3 Routers (Cisco 7200). Click on the download link of the images for GNS3.
- 3 Switches (Cisco IOU L2). Click on the download link of the images for GNS3.
- 4 PCs (Use the GNS3's VPCS)
- After the configuration of devices in GNS3, the Slots of the network adapters of the SW must be configured as follows:

1 configur	ation	
r conngui		
General settings	Network Usage	
Adapters		
Ethernet adapters:	4	\$

And of the Routers like this:

1 cor	nfiguration					
General	Memories and disks	Slots	Advanced	Environment	Usage	
Adapters						
slot 0:	C7200-IO-FE					•

Part 1: Build the Network and Configure Basic Device Settings and Interface Addressing

In Part 1, you will set up the network topology and configure basic settings and interface addressing.

Step 1: Cable the network as shown in the topology.

Attach the devices as shown in the topology diagram, and cable as necessary.

Step 2: Configure basic settings for each device.

a. Console into each device, enter global configuration mode, and apply the basic settings. The startup configurations for each device are provided below.

Router R1

hostname R1 ipv6 unicast-routing no ip domain lookup banner motd # R1, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit interface e1/0 ip address 209.165.200.225 255.255.255.224 ipv6 address fe80::1:1 link-local ipv6 address 2001:db8:200::1/64 no shutdown exit interface e1/2 ip address 10.XY.10.1 255.255.255.0 ipv6 address fe80::1:2 link-local ipv6 address 2001:db8:100:1010::1/64 no shutdown exit interface e1/1 ip address 10.XY.13.1 255.255.255.0 ipv6 address fe80::1:3 link-local ipv6 address 2001:db8:100:1013::1/64 no shutdown exit

Router R2

hostname R2 ipv6 unicast-routing no ip domain lookup banner motd # R2, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit interface e1/0 ip address 209.165.200.226 255.255.255.224 ipv6 address fe80::2:1 link-local ipv6 address 2001:db8:200::2/64 no shutdown exit interface Loopback 0 ip address 2.2.2.2 255.255.255.255 ipv6 address fe80::2:3 link-local ipv6 address 2001:db8:2222::1/128 no shutdown exit

Router R3

hostname R3 ipv6 unicast-routing no ip domain lookup banner motd # R3, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit interface e1/0 ip address 10.XY.11.1 255.255.255.0 ipv6 address fe80::3:2 link-local ipv6 address 2001:db8:100:1011::1/64 no shutdown exit interface e1/1 ip address 10.XY.13.3 255.255.255.0 ipv6 address fe80::3:3 link-local ipv6 address 2001:db8:100:1010::2/64 no shutdown exit

Switch D1

hostname D1 ip routing ipv6 unicast-routing no ip domain lookup banner motd # D1, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous

exit vlan 100 name Management exit vlan 101 name UserGroupA exit vlan 102 name UserGroupB exit vlan 999 name NATIVE exit interface e1/2 no switchport ip address 10.XY.10.2 255.255.255.0 ipv6 address fe80::d1:1 link-local ipv6 address 2001:db8:100:1010::2/64 no shutdown exit interface vlan 100 ip address 10.XY.100.1 255.255.255.0 ipv6 address fe80::d1:2 link-local ipv6 address 2001:db8:100:100::1/64 no shutdown exit interface vlan 101 ip address 10.XY.101.1 255.255.255.0 ipv6 address fe80::d1:3 link-local ipv6 address 2001:db8:100:101::1/64 no shutdown exit interface vlan 102 ip address 10.XY.102.1 255.255.255.0 ipv6 address fe80::d1:4 link-local ipv6 address 2001:db8:100:102::1/64 no shutdown exit ip dhcp excluded-address 10.XY.101.1 10.XY.101.109 ip dhcp excluded-address 10.XY.101.141 10.XY.101.254 ip dhcp excluded-address 10.XY.102.1 10.XY.102.109 ip dhcp excluded-address 10.XY.102.141 10.XY.102.254 ip dhcp pool VLAN-101

network 10.XY.101.0 255.255.255.0 default-router 10.XY.101.254 exit ip dhcp pool VLAN-102 network 10.XY.102.0 255.255.255.0 default-router 10.XY.102.254 exit interface range e0/0-3,e1/0-1,e1/3,e2/0-3,e3/0-3 shutdown exit

Switch D2

hostname D2 ip routing ipv6 unicast-routing no ip domain lookup banner motd # D2, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit vlan 100 name Management exit vlan 101 name UserGroupA exit vlan 102 name UserGroupB exit vlan 999 name NATIVE exit interface e1/0 no switchport ip address 10.XY.11.2 255.255.255.0 ipv6 address fe80::d1:1 link-local ipv6 address 2001:db8:100:1011::2/64 no shutdown exit interface vlan 100 ip address 10.XY.100.2 255.255.255.0 ipv6 address fe80::d2:2 link-local

ipv6 address 2001:db8:100:100::2/64 no shutdown exit interface vlan 101 ip address 10.XY.101.2 255.255.255.0 ipv6 address fe80::d2:3 link-local ipv6 address 2001:db8:100:101::2/64 no shutdown exit interface vlan 102 ip address 10.XY.102.2 255.255.255.0 ipv6 address fe80::d2:4 link-local ipv6 address 2001:db8:100:102::2/64 no shutdown exit ip dhcp excluded-address 10.XY.101.1 10.XY.101.209 ip dhcp excluded-address 10.XY.101.241 10.XY.101.254 ip dhcp excluded-address 10.XY.102.1 10.XY.102.209 ip dhcp excluded-address 10.XY.102.241 10.XY.102.254 ip dhcp pool VLAN-101 network 10.XY.101.0 255.255.255.0 default-router XY.0.101.254 exit ip dhcp pool VLAN-102 network 10.XY.102.0 255.255.255.0 default-router 10.XY.102.254 exit interface range e0/0-3,e1/1-3,e2/0-3,e3/0-3 shutdown exit

Switch A1

hostname A1 no ip domain lookup banner motd # A1, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit vlan 100 name Management exit vlan 101

name UserGroupA exit vlan 102 name UserGroupB exit vlan 999 name NATIVE exit interface vlan 100 ip address 10.XY.100.3 255.255.255.0 ipv6 address fe80::a1:1 link-local ipv6 address 2001:db8:100:100::3/64 no shutdown exit interface range e0/0,e0/3,e1/0,e2/1-3,e3/0-3 shutdown exit

- b. Save the running configuration to startup-config on all devices.
- c. Configure PC 1 and PC 4 host addressing as shown in the addressing table. Assign a default gateway address of 10.XY.100.254 which will be the HSRP virtual IP address used in Part 4.

Part 2: Configure the Layer 2 Network and Host Support

In this part of the Skills Assessment, you will complete the Layer 2 network configuration and set up basic host support. At the end of this part, all the switches should be able to communicate. PC2 and PC3 should receive addressing from DHCP and SLAAC.

Task#	Task	Specification	Points
	On all switches, configure IEEE 802.1Q trunk interfaces on	Enable 802.1Q trunk links between:	
2.1	interconnecting switch links	 D1 and D2 D1 and A1 D2 and A1 	6
2.2	On all switches, change the native VLAN on trunk links.	Use VLAN 999 as the native VLAN.	6
2.3	On all switches, enable the Rapid Spanning-Tree Protocol.	Use Rapid Spanning Tree.	3
2.4	On D1 and D2, configure the appropriate RSTP root bridges based on the information in the topology diagram.	Configure D1 and D2 as root for the appropriate VLANs with mutually supporting priorities in case of switch failure.	2

Your configuration tasks are as follows:

Task#	Task	Specification	Points
	D1 and D2 must provide backup in case of root bridge failure.		
2.5	On all switches, create LACP EtherChannels as shown in the topology diagram.	Use the following channel numbers: • D1 to D2 – Port channel 12 • D1 to A1 – Port channel 1 • D2 to A1 – Port channel 2	3
2.6	On all switches, configure host access ports connecting to PC1, PC2, PC3, and PC4.	Configure access ports with appropriate VLAN settings as shown in the topology diagram. Host ports should transition immediately to forwarding state.	4
2.7	Verify IPv4 DHCP services.	PC2 and PC3 are DHCP clients and should be receiving valid IPv4 addresses.	1
2.8	Verify local LAN connectivity.	PC1 should successfully ping: • D1: 10 27.100.1 • D2: 10. 27.100.2 • PC4: 10.27.100.6 PC2 should successfully ping: • D1: 10.27.102.1 • D2: 10.27.102.2 PC3 should successfully ping: • D1: 10.27.101.1 • D2: 10.27.101.2 PC4 should successfully ping: • D1: 10.27.100.1 • D2: 10.27.100.2 • PC1: 10.27.100.5	1

ENCOR Skills Assessment (Scenario 1)

Figura 1 Construcción del Escenario 1 en el simulador GNS3.



Configuración para router R1 en GNS3

conf t hostname R1 ipv6 unicast-routing no ip domain lookup banner motd # R1, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit interface g0/0 ip address 209.165.200.225 255.255.255.224 ipv6 address fe80::1:1 link-local ipv6 address 2001:db8:200::1/64 no shutdown exit interface g1/0 ip address 10.27.10.1 255.255.255.0 ipv6 address fe80::1:2 link-local ipv6 address 2001:db8:100:1010::1/64 no shutdown exit interface s4/0

ip address 10.27.13.1 255.255.255.0 ipv6 address fe80::1:3 link-local ipv6 address 2001:db8:100:1013::1/64 no shutdown exit

Figura 2 Configuración para R1 en el simulador GNS3.



Configuración para router R2 en GNS3

conf t hostname R2 ipv6 unicast-routing no ip domain lookup banner motd # R2, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit interface g0/0 ip address 209.165.200.226 255.255.255.224 ipv6 address fe80::2:1 link-local ipv6 address 2001:db8:200::2/64 no shutdown exit interface Loopback 0 ip address 2.2.2.2 255.255.255.255

ipv6 address fe80::2:3 link-local ipv6 address 2001:db8:2222::1/128 no shutdown exit

Figura 3 Configuración para R2 en el simulador GNS3.



Configuración para router R3 en GNS3

conf t hostname R3 ipv6 unicast-routing no ip domain lookup banner motd # R3, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit interface g1/0 ip address 10.27.11.1 255.255.255.0 ipv6 address fe80::3:2 link-local ipv6 address 2001:db8:100:1011::1/64 no shutdown exit interface s4/0 ip address 10.27.13.3 255.255.255.0 ipv6 address fe80::3:3 link-local ipv6 address 2001:db8:100:1010::2/64

no shutdown exit

Figura 4 Configuración para R3 en el simulador GNS3.



Configuración para router Switch D1 en GNS3

conf t hostname D1 ip routing ipv6 unicast-routing no ip domain lookup banner motd # D1, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit vlan 100 name Management exit vlan 101 name UserGroupA exit vlan 102 name UserGroupB exit vlan 999 name NATIVE exit interface e1/1 no switchport ip address 10.27.10.2 255.255.255.0 ipv6 address fe80::d1:1 link-local ipv6 address 2001:db8:100:1010::2/64 no shutdown exit interface vlan 100 ip address 10.27.100.1 255.255.255.0 ipv6 address fe80::d1:2 link-local ipv6 address 2001:db8:100:100::1/64 no shutdown exit interface vlan 101 ip address 10.27.101.1 255.255.255.0 ipv6 address fe80::d1:3 link-local ipv6 address 2001:db8:100:101::1/64 no shutdown exit interface vlan 102 ip address 10.27.102.1 255.255.255.0 ipv6 address fe80::d1:4 link-local ipv6 address 2001:db8:100:102::1/64 no shutdown exit ip dhcp excluded-address 10.27.101.1 10.27.101.109 ip dhcp excluded-address 10.27.101.141 10.27.101.254 ip dhcp excluded-address 10.27.102.1 10.27.102.109 ip dhcp excluded-address 10.27.102.141 10.27.102.254 ip dhcp pool VLAN-101 network 10.27.101.0 255.255.255.0 default-router 10.27.101.254 exit ip dhcp pool VLAN-102 network 10.27.102.0 255.255.255.0 default-router 10.27.102.254

```
exit
interface range e0/0-3,e1/0,e1/2-3,e2/0-3,e3/0-3
shutdown
exit
```

Figura 5 Configuración para D1 en el simulador GNS3.



Configuración para router Switch D2 en GNS3

conf t hostname D2 ip routing ipv6 unicast-routing no ip domain lookup banner motd # D2, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit vlan 100 name Management exit vlan 101 name UserGroupA exit vlan 102

name UserGroupB exit vlan 999 name NATIVE exit interface e1/1 no switchport ip address 10.27.11.2 255.255.255.0 ipv6 address fe80::d1:1 link-local ipv6 address 2001:db8:100:1011::2/64 no shutdown exit interface vlan 100 ip address 10.27.100.2 255.255.255.0 ipv6 address fe80::d2:2 link-local ipv6 address 2001:db8:100:100::2/64 no shutdown exit interface vlan 101 ip address 10.27.101.2 255.255.255.0 ipv6 address fe80::d2:3 link-local ipv6 address 2001:db8:100:101::2/64 no shutdown exit interface vlan 102 ip address 10.27.102.2 255.255.255.0 ipv6 address fe80::d2:4 link-local ipv6 address 2001:db8:100:102::2/64 no shutdown exit ip dhcp excluded-address 10.27.101.1 10.27.101.209 ip dhcp excluded-address 10.27.101.241 10.27.101.254 ip dhcp excluded-address 10.27.102.1 10.27.102.209 ip dhcp excluded-address 10.27.102.241 10.27.102.254 ip dhcp pool VLAN-101 network 10.27.101.0 255.255.255.0 default-router 27.0.101.254 exit ip dhcp pool VLAN-102 network 10.27.102.0 255.255.255.0 default-router 10.27.102.254 exit interface range e0/0-3,e1/0,e1/2-3,e2/0-3,e3/0-3 shutdown exit

Figura 6. Configuración para D2 en el simulador GNS3.



Configuración para router Switch A1 en GNS3

conf t hostname A1 no ip domain lookup banner motd # A1, ENCOR Skills Assessment# line con 0 exec-timeout 0 0 logging synchronous exit vlan 100 name Management exit vlan 101 name UserGroupA exit vlan 102 name UserGroupB exit vlan 999 name NATIVE exit interface vlan 100

```
ip address 10.27.100.3 255.255.255.0
ipv6 address fe80::a1:1 link-local
ipv6 address 2001:db8:100:100::3/64
no shutdown
exit
interface range e1/1-3,e2/0-3,e3/0-3
shutdown
exit
```





CONFIGURAR LA CAPA 2 DE LA RED Y EL SOPORTE DE HOST

Configuración para router Switch D1 en GNS3

conf t interface range e0/1-3, e1/0 switchport trunk encapsulation dot1q switchport mode trunk switchport trunk native vlan 999 channel-group 12 mode active no shutdown exit interface range e2/1-2 switchport trunk encapsulation dot1q switchport mode trunk switchport trunk native vlan 999 channel-group 1 mode active no shutdown exit spanning-tree mode rapid-pvst spanning-tree vlan 100 root primary spanning-tree vlan 102 root primary spanning-tree vlan 101 root secondary interface range e2/3 switchport mode access switchport access vlan 100 spanning-tree portfast no shutdown exit end

Figura 8. Configuración para D1 capa en el simulador GNS3.



Configuración para router Switch D2 en GNS3

conf t interface range e0/1-3, e1/0 switchport trunk encapsulation dot1q switchport mode trunk switchport trunk native vlan 999 channel-group 12 mode active no shutdown exit interface range e2/1-2 switchport trunk encapsulation dot1q switchport mode trunk switchport trunk native vlan 999 channel-group 1 mode active no shutdown exit spanning-tree mode rapid-pvst spanning-tree vlan 100 root primary spanning-tree vlan 102 root primary spanning-tree vlan 101 root secondary interface range e2/3 switchport mode access switchport access vlan 100 spanning-tree portfast no shutdown exit end

Figura 9. Configuración para D2 capa en el simulador GNS3



Configuración para router Switch A1 en GNS3

conf t

spanning-tree mode rapid-pvst interface range e0/1-2 switchport trunk encapsulation dot1q switchport mode trunk switchport trunk native vlan 999 channel-group 1 mode active no shutdown exit interface range e0/3,e1/0 switchport trunk encapsulation dot1q switchport mode trunk switchport trunk native vlan 999 channel-group 2 mode active no shutdown exit interface range e2/3 switchport mode access switchport access vlan 101 spanning-tree portfast no shutdown exit interface range e3/0 switchport mode access switchport access vlan 100 spanning-tree portfast

no shutdown exit end



Figura 10. Configuración para A1 capa en el simulador GNS3

show interface trunk para router Switch D1 en GNS3

Figura 11. show interface trunk para router Switch D1 en el simulador GNS3



show run | include spanning-tree para router Switch D1 en GNS3

Figura 12. show run | include spanning-tree para router Switch D1 en el simulador GNS3



show run interface e2/3 para router Switch D1 en GNS3


Figura 13. show run interface e2/3 para router Switch D1 en el simulador GNS3

show interface trunk para router Switch A1 en GNS3

Figura 14. show interface trunk para router Switch A1 en el simulador GNS3



show run interface e2/3 para router Switch A1 en GNS3



Figura 15. show run interface e2/3 para router Switch A1 en el simulador GNS3

show run interface e3/0 para router Switch A1 en GNS3



Figura 16. show run interface e3/0 para router Switch A1 en el simulador GNS3

PC1:

D1: ping 10.27.100.1

Figura 17. Ping 10.27.100.1



D2: ping 10.27.100.2

Figura 18. Ping 10.27.100.2



PC2

D1: ping 10.27.102.1

Figura 19. ping 10.27.102.1



D2: ping 10.27.102.2

Figura 19. ping 10.27.102.2





D1: ping 10.27.101.1

Figura 21. ping 10.27.101.1



D2: ping 10.27.101.2

Figura 22. ping 10.27.101.2





D1: ping 10.27.100.1

Figura 23. ping 10.27.100.1



D2: ping 10.27.100.2

Figura 24. ping 10.27.100.2



ENCOR Skills Assessment (Scenario 2)

Continuation of the Scenario 1

Part 1: Configure Routing Protocols

In this part, you will configure IPv4 and IPv6 routing protocols. At the end of this part, the network should be fully converged. IPv4 and IPv6 pings to the Loopback 0 interface from D1 and D2 should be successful.

Note: Pings from the hosts will not be successful because their default gateways are pointing to the HSRP address which will be enabled in Part 4. Your configuration tasks are as follows:

Task#	Task	Specification	Points
3.1	On the "Company Network" (i.e., R1, R3, D1, and D2), configure single-area OSPFv2 in area 0.	 Use OSPF Process ID 4 and assign the following router-IDs: R1: 0.0.4.1 R3: 0.0.4.3 D1: 0.0.4.131 D2: 0.0.4.132 On R1, R3, D1, and D2, advertise all directly connected networks / VLANs in Area 0. On R1, do not advertise the R1 – R2 network. On R1, propagate a default route will be provided by BGP. Disable OSPFv2 advertisements on: D1: All interfaces except E1/2 D2: All interfaces except E1/2 	8

Task#	Task	Specification	Points
3.2	On the "Company Network" (i.e., R1, R3, D1, and D2), configure classic single-area OSPFv3 in area 0.	 Use OSPF Process ID 6 and assign the following router-IDs: R1: 0.0.6.1 R3: 0.0.6.3 D1: 0.0.6.131 D2: 0.0.6.132 On R1, R3, D1, and D2, advertise all directly connected networks / VLANs in Area 0. On R1, do not advertise the R1 – R2 network. On R1, propagate a default route will be provided by BGP. Disable OSPFv3 advertisements on: D1: All interfaces except E1/2 D2: All interfaces except E1/0 	8
3.3	On R2 in the "ISP Network", configure MP-BGP.	 Configure two default static routes via interface Loopback 0: An IPv4 default static route. An IPv6 default static route. Configure R2 in BGP ASN 500 and use the router-id 2.2.2.2. Configure and enable an IPv4 and IPv6 neighbor relationship with R1 in ASN 300. In IPv4 address family, advertise: The Loopback 0 IPv4 network (/32). The default route (0.0.0.0/0). In IPv6 address family, advertise: The Loopback 0 IPv4 network (/128). The default route (::/0). 	4

Task#	Task	Specification	Points
3.4	On R1 in the "ISP Network", configure MP-BGP.	 Configure two static summary routes to interface Null 0: A summary IPv4 route for 10.XY.0.0/8. A summary IPv6 route for 2001:db8:100::/48. Configure R1 in BGP ASN 300 and use the router-id 1.1.1.1. Configure an IPv4 and IPv6 neighbor relationship with R2 in ASN 500. In IPv4 address family: Disable the IPv6 neighbor relationship. Enable the IPv4 neighbor relationship. Advertise the 10.XY.0.0/8 network. In IPv6 address family: Disable the IPv4 neighbor relationship. Enable the IPv4 neighbor relationship. Enable the IPv4 neighbor relationship. 	4

Task#	Task	Specification	Points
		 Advertise the 2001:db8:100::/48 network. 	

Part 2: Configure First Hop Redundancy

In this part, you will configure HSRP version 2 to provide first-hop redundancy for hosts in the "Company Network". Your configuration tasks are as follows:

Task#	Task	Specification	Points
	On D1, create IP	Create two IP SLAs.	
	SLAs that test the reachability of R1 interface E1/2.	 Use SLA number 4 for IPv4. Use SLA number 6 for IPv6. 	
		The IP SLAs will test availability of R1 E1/2 interface every 5 seconds.	
4.1		Schedule the SLA for immediate implementation with no end time.	2
		Create an IP SLA object for IP SLA 4 and one for IP SLA 6.	
		 Use track number 4 for IP SLA 4. Use track number 6 for IP SLA 6. 	
		The tracked objects should notify D1 if the IP SLA state changes from down to	

Task#	Task	Specification	Points
		up after 10 seconds, or from up to down after 15 seconds.	
4.2	On D2, create IP SLAs that test the reachability of R3 interface E1/0.	Create two IP SLAs. • Use SLA number 4 for IPv4. • Use SLA number 6 for IPv6. The IP SLAs will test availability of R3 E1/0 interface every 5 seconds. Schedule the SLA for immediate implementation with no end time. Create an IP SLA object for IP SLA 4 and one for IP SLA 6. • Use track number 4 for IP SLA 4. • Use track number 6 for IP SLA 6. The tracked objects should notify D1 if the IP SLA state changes from down to	2
		up after 10 seconds, or from up to down after 15 seconds.	
4.3	On D1, configure HSRPv2.	 D1 is the primary router for VLANs 100 and 102; therefore, their priority will also be changed to 150. Configure HSRP version 2. Configure IPv4 HSRP group 104 for VLAN 100: Assign the virtual IP address 10.XY.100.254. Set the group priority to 150. Enable preemption. Track object 4 and decrement by 60. Configure IPv4 HSRP group 114 for VLAN 101: Assign the virtual IP address 10.XY.101.254. Enable preemption. Track object 4 to decrement by 60. Configure IPv4 HSRP group 124 for VLAN 101: 	8

Task#	Task	Specification	Points
		 Assign the virtual IP address 10.XY.102.254. Set the group priority to 150. Enable preemption. Track object 4 to decrement by 60. Configure IPv6 HSRP group 106 for VLAN 100: Assign the virtual IP address using ipv6 autoconfig. Set the group priority to 150. Enable preemption. Track object 6 and decrement by 60. Configure IPv6 HSRP group 116 for VLAN 101: Assign the virtual IP address using ipv6 autoconfig. Enable preemption. Track object 6 and decrement by 60. Configure IPv6 HSRP group 116 for VLAN 101: Assign the virtual IP address using ipv6 autoconfig. Enable preemption. Track object 6 and decrement by 60. Configure IPv6 HSRP group 126 for VLAN 102: Assign the virtual IP address using ipv6 autoconfig. Set the group priority to 150. 	
		 Enable preemption. Track object 6 and decrement by 60. 	
	On D2, configure HSRPv2.	 D2 is the primary router for VLAN 101; therefore, the priority will also be changed to 150. Configure HSRP version 2. Configure IPv4 HSRP group 104 for VLAN 100: Assign the virtual IP address 10.XY.100.254. Enable preemption. Track object 4 and decrement by 60. Configure IPv4 HSRP group 114 for VLAN 101: 	

Task#	Task	Task Specification						
		 Assign the virtual IP address 10.XY.101.254. Set the group priority to 150. Enable preemption. Track object 4 to decrement by 60. Configure IPv4 HSRP group 124 for VLAN 102: 						
		 Assign the virtual IP address 10.XY.102.254. Enable preemption. Track object 4 to decrement by 60. Configure IPv6 HSRP group 106 for VLAN 100: 						
		 Assign the virtual IP address using ipv6 autoconfig. Enable preemption. Track object 6 and decrement by 60. Configure IPv6 HSRP group 116 for VLAN 101: 						
		 Assign the virtual IP address using ipv6 autoconfig. Set the group priority to 150. Enable preemption. Track object 6 and decrement by 60. Configure IPv6 HSRP group 126 for VLAN 102: 						
		 Assign the virtual IP address using ipv6 autoconfig. Enable preemption. Track object 6 and decrement by 60. 						

Configuración para router R1 0.0.4.1 en GNS3

conf t router ospf 4 router-id 0.0.4.1 network 10.30.10.0 0.0.0.255 area 0 network 10.30.13.0 0.0.0.255 area 0 default-information originate



Figura 25. Configuración para router R1 0.0.4.1 en GNS3

Configuración para router R3 0.0.4.3 en GNS3

conf t router ospf 4 router-id 0.0.4.1 network 10.30.10.0 0.0.0.255 area 0

network 10.30.13.0 0.0.0.255 area 0 default-information originate

Figura 26. Configuración para router R3 0.0.4.3 en GNS3



Configuración para router D1 0.0.4.131 en GNS3

conf t router ospf 4 router-id 0.0.4.131 passive-interface default no passive-interface e1/2 network 10.30.10.0 0.0.0.255 area 0 network 10.30.101.0 0.0.0.255 area 0 network 10.30.102.0 0.0.0.255 area 0

Figura 27. Configuración para router D1 0.0.4.131 en GNS3



Configuración para router D2 0.0.4.132 en GNS3

conf t router ospf 4 router-id 0.0.4.132 passive-interface default no passive-interface e1/0 network 10.0.11.0 0.0.0.255 area 0 network 10.0.101.0 0.0.0.255 area 0 network 10.0.102.0 0.0.0.255 area 0

Figura 28. Configuración para router D2 0.0.4.132 en GNS3



Configuración para router R1 OSPF Process ID 6 en GNS3

conf t router ospf 4 router-id 0.0.4.132 passive-interface default no passive-interface e1/0 network 10.0.11.0 0.0.0.255 area 0 network 10.0.101.0 0.0.0.255 area 0 network 10.0.102.0 0.0.0.255 area 0

Figura 29. Configuración para router R1 OSPF Process ID 6 en GNS3

Configuración para router R3 OSPF Process ID 6 en GNS3

conf t ipv6 router ospf 6 router-id 0.0.6.3 exit interface g1/0 ipv6 ospf 6 area 0 exit interface s4/0 ipv6 ospf 6 area 0 exit

Figura 30. Configuración para router R3 OSPF Process ID 6 en GNS3

<u>Edit View</u> Control	Node Annotate <u>T</u> o	ols <u>H</u> elp	Over	view 🔍 R1	R2	• D1	• R3	×	• D2	A1	€) -		×
🖹 🗁 🖸 🖁	╣>_ ▶		*Nov 29 17 hernet1/1	:27:33.731: %CD (half duplex).	DP-4-DUPLEX_MISMATC	H: duplex mi	smatch disc	overed	on Gigabit	Ethernet1/0 (not half	duplex),	with D2 Et	^
8			R3# *Nov 29 17 hernet1/1	:28:31.739: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					01
		R	*Nov 29 17 hernet1/1	:29:25.407: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					00 02 02
			*Nov 29 17 hernet1/1	:30:18.099: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					05
2		g1/0	R3# *Nov 29 17 hernet1/1	:31:10.727: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					09
	DC1	e1/1	*Nov 29 17 hernet1/1	:32:10.423: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					•
	VPCS	e2/3	*Nov 29 17	:33:10.467: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					•
0	eO		*Nov 29 17 hernet1/1	:34:00.831: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					•
			R3# *Nov 29 17 hernet1/1 R3#conf t	:34:53.743: %CD (half duplex).	DP-4-DUPLEX_MISMATC				on Gigabit					
			Enter conf R3(config) R3(config-	iguration comma #ipv6 router os rtr)#router-id	ands, one per line. spf 6 0.0.6.3									
			PC3 R3(config- R3(config) R3(config-	rtr)#exit #interface g1/0 if)#ipv6 ospf 6	0 5 area 0									
		L.	R3(config R3(config)	if)#exit #interface s4/0										
			R3(config- R3(config- R3(config)	if)#ipv6 ospf 6 if)#exit # <mark>_</mark>										~
			solarwind	s♥ Solar-PuTTY	free tool				_	© 2019 SolarWi	nds Worldv	vide, LLC. Al	l rights reserve	2d.
4										Þ				

Configuración para router D1 OSPF Process ID 6 en GNS3

```
conf t
ipv6 router ospf 6
router-id 0.0.6.131
passive-interface default
no passive-interface e1/1
exit
interface e1/1
ipv6 ospf 6 area 0
exit
interface vlan 100
ipv6 ospf 6 area 0
exit
interface vlan 101
ipv6 ospf 6 area 0
exit
interface vlan 102
ipv6 ospf 6 area 0
exit
```

Figura 31. Configuración para router D1 OSPF Process ID 6 en GNS3

😢 ENCOR_Skills - GNS3 File Edit View Control Node Annotate Tools Help				- 0 ×
FILE Edit View Control Node Annotate Look Help	*Nov 29 22:39:13.787: %SYS-5-CONFIG_1: Conf *Nov 29 22:39:13.787: %SYS-5-CONFIG_1: Conf *Nov 29 22:30:83.991: %CD-4-DUPLEX_MISWATCH hernet1/0 (full duplex). *Nov 29 22:40:54.821: %CD-4-DUPLEX_MISWATCH hernet1/0 (full duplex). Nov 29 22:40:54.821: %CD-4-DUPLEX_MISWATCH hernet1/0 (full duplex). Di(config_entr)*paration : Gomes. Di(config_entr)*paration: Gomes. Di(config_entr)*parative-interface default Di(config_entr)*parative-interface default Di(config_entr)*parative-interface default Di(config_entr)*parative-interface default Di(config_entr)*parative-interface Di(config_entr)*parativ	D1 × R3 igured from console by consol if duplex mismatch discovered seesament End with CNTL/2. cess 6, Nbr 0.0.6.1 on Etherr igured from console by consol	e D2 • Al	uplex), with R1 GigabitEt uplex), with R1 GigabitEt uplex), with R1 GigabitEt 03 05 07 09
	*Nov 29 22:41:45.080: %CDP-4-DUPLEX_MISMATCH hernetl/0 (full duplex). D1#	H: duplex mismatch discovered	on Ethernet1/1 (not full d	uplex), with R1 GigabitEt
4	solarwinds P Solar-Put I Pree tool		© 2019 SolarWinds	wonawide, LLC. All rights reserved.
	const 💷 Ecconst 🙆 Numis 🗖 GNS2 V 🦽	ENCOR Di Guía da 🗰 com	an 🖸 Di 📕 Faco final	² ∧ < (= 1)) ESD 5-12

Configuración para router D2 OSPF Process ID 6 en GNS3

conf t ipv6 router ospf 6 router-id 0.0.6.132 passive-interface default no passive-interface e1/1 exit interface e1/1 ipv6 ospf 6 area 0 exit interface vlan 100 ipv6 ospf 6 area 0 exit interface vlan 101 ipv6 ospf 6 area 0 exit interface vlan 102 ipv6 ospf 6 area 0 exit

Figura 32. Configuración para router D2 OSPF Process ID 6 en GNS3

Configuración para router R2 configure MP-BGP en GNS3

conf t ip route 0.0.0.0 0.0.0.0 Loopback0 ipv6 route ::/0 Loopback0 router bgp 500 bgp router-id 2.2.2.2 router bgp 500 bgp router-id 2.2.2.2 bgp log-neighbor-changes neighbor 2001:DB8:200::1 remote-as 300 neighbor 209.165.200.225 remote-as 300 ! address-family ipv4 network 0.0.0.0 network 2.2.2.2 mask 255.255.255.255 no neighbor 2001:DB8:200::1 activate neighbor 209.165.200.225 activate exit-address-family address-family ipv6 network ::/0 network 2001:DB8:2222::/128 neighbor 2001:DB8:200::1 activate exit-address-family

Figura 33. Configuración para router R2 configure MP-BGP en GNS3

Configuración para router R1 configure MP-BGP en GNS3

conf t ip route 10.0.0.0 255.0.0.0 null0 ipv6 route 2001:db8:100::/48 null0 router bgp 300 bgp router-id 1.1.1.1 router bgp 300 bgp router-id 1.1.1.1 neighbor 209.165.200.226 remote-as 500 neighbor 2001:db8:200::2 remote-as 500 address-family ipv4 unicast neighbor 209.165.200.226 activate no neighbor 2001:db8:200::2 activate network 10.0.0.0 mask 255.0.0.0 exit-address-family address-family ipv6 unicast no neighbor 209.165.200.226 activate neighbor 2001:db8:200::2 activate network 2001:db8:100::/48 exit-address-family

Figura 34. Configuración para router R1 configure MP-BGP en GNS3

Verificación para router R1

show run | section ^router ospf show run | section ^ipv6 router show run | section bgp show run | include router

Figura 35. Verificación para router R1

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	PC1 vrcs e2 e0	g1/0 e1/1 f1 /3	<pre>He Nov 29 18:92:17.i Nov 29 18:92:17.i PrenetLV1 (half di Hishor nul sec Hishor nul sec Hishor nul sec Nov 29 18:93:10.i Hishor nul sec Hov 29 18:93:10.i Hishor nul sec Hov 29 18:93:10.i Hishor 2001:108 Hishor 2001:108 Hishor 2001:108 Hishor 209.105 I Hishor 200.105 I Hishor 209.105 I Hishor 209.</pre>	895: %CDP- uplex). tion 'apu' 6 1 on origin tion bgp 943: %CDP- uplex).rou 1.1.1 -changes 8:200::2; 8:200::2; 1.200.226 : 0 5:200.226 : 1.10B8:200 5:200.226 : 1.10B8:200 5:200	-4-DUPLEX_MISMA 6 router nate -4-DUPLEX_MISMA tuter bgp 300 remote-as 500 remote-as 500 remote-as 500 ::2 activate activate 8 activate -4-DUPLEX_MISMA er			red on Gigabit red on Gigabit red on Gigabit			, with D1 Et , with D1 Et	01 00 02 03 05 07 09	888
	1		solarwindsਞ So	olar-PuTTY 🎓	ee tool				© 2019 SolarWinds	Worldwide, LLC. A	ll rights reserved		
		106300		C Num			Guía do 📖 c	oman 🧑 P1	Esco fina	-8 • (- A= -4.) rcn	6:05	

Verificación para router R2

show run | section ^router ospf show run | section ^ipv6 router show run | section bgp show run | include router

Figura 36. Verificación para router R2

	Skills - GNS3	- · · · ·	_										-	٥	×
<u>File</u> <u>E</u> dit	: View Control Node Annotat	e <u>l</u> oois <u>H</u> elp		Overview	R1	 R2 	× 🔍 D1	R3	D2	 A1 	\oplus		•	×	
	Yew Control Node Annotat	e loois Help g1/0 e1/1	R1 R2((R2((R2((R2((R2((R2((R2((R2	Overview config-router config-router config-router config-router config-router config-router / 29 17:59:17 config-router / 29 18:05:35 show run se thom run se	RI -af)#exit-a)#1 -af)#etworl -af)#networl -af)#networl -af)#networl -af)#etworl -af)#exit-a)# .227: %BGP-1)# .339: %BGP-1)#end .175: %SYS-1 ction ^ipv6	<pre>ddress-family amily ipv6 k ::/0 k 2001:DB8:22 or 2001:DB8:2 ddress-family 5-ADJCHANGE: 5-ADJCHANGE: 5-ADJCHANGE: 5-CONFIG_I: C er ospf ; router</pre>	× • D1	• R3 5.200.225 Up 88:200:11 pass 88:200:11 Up console by con	• D2 ive reset (Per	• Al	ession)	-		× 01 00 02 03 05 07 09	× C
		e2/3	PC3	<pre>show run se ter bgp 500 p router-id 2 p log-neighbo ighbor 2001:D ighbor 2001:D twork 0.0.0. etwork 2.2.2. p neighbor 209.1 it-address-family dress-family dress-family dress-family dress-family</pre>	<pre>::::::::::::::::::::::::::::::::::::</pre>	emote-as 300 emote-as 300 255.255.255 :1 activate activate 28									
	4		so	larwinds S	Solar-PuTTY fre	er tool				© 2019 SolarWind	ls Worldwide, L	LC. All righ	its reserve	▼ d1	

Verificación para router R3

show run | section ^router ospf show run | section ^ipv6 router show run | section bgp show run | include router

Figura 37. Verificación para router R3

ENCOR_SI Eile Edit	kills - GNS3 View Control Node Annotate <u>T</u> ools	Help	• Quantieur	P1	P 2	DI	• 22		• D2	• •1			-	s ×
	₽ 🕓 🔣 >_ 🕨	C	Nov 29 18:01:55	.603: %CDP-	-4-DUPLEX_MISMATCH	: duplex mi	smatch disc	overed	on Gigabi	tEthernet1/0 (ne	⊕ nt half du	plex), wi	th D2 Et	^
•		R H R	3(config)# Nov 29 18:02:44 ernet1/1 (half (3(config)#	.235: %CDP- duplex).	-4-DUPLEX_MISMATCH				on Gigabi				th D2 Et	01 00
-		R1	Nov 29 18:05:45 ernet1/1 (half (3(config)# Nov 29 18:04:33 ernet1/1 (half (.005: ACDP- duplex). .519: %CDP- duplex).	-4-DUPLEX_MISMATCH	: duplex mi	smatch disc		on Gigabi	tEthernet1/0 (n	nt half du	plex), wi plex), wi	th D2 Et	02 03 05 07
Ţ		g1/0	3(config)# Nov 29 18:05:26 ernet1/1 (half d 3(config)#	.335: %CDP- duplex).	-4-DUPLEX_MISMATCH				on Gigabi				th D2 Et	09
	PC1	e1/1	Nov 29 18:06:16 ernet1/1 (half d 3(config)#end 3#	.935: %CDP- duplex).	-4-DUPLEX_MISMATCH	: duplex mi	smatch disc	overed	on Gigabi	ttthernet1/0 (n	t half du	plex), wi	th D2 Et	
⊗ ₽ ⊑ 0	VPCS e2	/ ³ *	Nov 29 18:07:02 3# Nov 29 18:07:08 ernet1/1 (half	.675: %SYS- .195: %CDP- duplex).	-5-CONFIG_I: Conf: -4-DUPLEX_MISMATCH				e on Gigabi				th D2 Et	
5		PC3 8	13#show run se router ospf 4 router-id 0.0.4 network 10.30.1 network 10.30.1 default-information 13#show run se pv6 router ospf	.1 0.0 0.0.0.2 1.0 0.0.0.2 3.0 0.0.0.2 tion origin ction ^ipve 6	ter ospt 255 area 0 255 area 0 255 area 0 nate 6 router									
		VPCS	router-id 0.0.6 13#show run ser	.3 ction bgp .219: %CDP-	-4-DUPLEX_MISMATCH				on Gigabi				th D2 Et	
		h	ernet1/1 (half o	duplex).R3#	#show run includ	e router								~
4			solarwınds [♥] S	iolar-PuTTY 🎢	ee tool					© 2019 SolarWind	s Worldwide,	, LLC. All righ	hts reserved.	
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Verificación para router D1

show run | section ^router ospf show run | section ^ipv6 router show run | section bgp show run | include router

Figura 38. Verificación para router D1

Pit Hornet1/0 (full duplex). If Hornet1/0	g ENCOR_Skills - GNS3 Eile Edit View Control Node Annotate Iools 且elp	: Overview R1 R2	• D1 × • R3 • D2	● A1	- • · ·
DJ#show run section bgp pc3 ^{DI#show} run include router	File Edit File Control Node Annotate Image: Second control Node Image: Second control Image: Second control Image: Second control <td< td=""><td>Overview R1 R2 915 715 716 717 918 718 XCDP-4-DUPLEX_MISMATCH: 0 0 hermet1/0 (full duplex). 018 718 718 "Nov 29 23:06:57,281: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:55,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:55,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:55,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:53,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 0 "Nov 29 23:07:53,100: XCDP-4-DUPLEX_MISMATCH: 0 0</td><td>D1 × R3 D2 duplex mismatch discovered on Ether duplex mismatch discovered on Ether</td><td>• AI • AI • net1/1 (not full duplex), * • net1/1 (not full duplex), * • net1/1 (not full duplex), * • net1/1 (not full duplex), *</td><td>ith R1 GigabitEt ith R1 GigabitEt 01 00 03 05 05 05 07 09 09</td></td<>	Overview R1 R2 915 715 716 717 918 718 XCDP-4-DUPLEX_MISMATCH: 0 0 hermet1/0 (full duplex). 018 718 718 "Nov 29 23:06:57,281: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:55,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:55,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:55,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 "Nov 29 23:06:53,053: XCDP-4-DUPLEX_MISMATCH: 0 0 0 0 0 "Nov 29 23:07:53,100: XCDP-4-DUPLEX_MISMATCH: 0 0	D1 × R3 D2 duplex mismatch discovered on Ether duplex mismatch discovered on Ether	• AI • AI • net1/1 (not full duplex), * • net1/1 (not full duplex), * • net1/1 (not full duplex), * • net1/1 (not full duplex), *	ith R1 GigabitEt ith R1 GigabitEt 01 00 03 05 05 05 07 09 09

Verificación para router D2

show run | section ^router ospf show run | section ^ipv6 router show run | section bgp show run | include router

Figura 39. Verificación para router D2

BINCOR_Skills - GNS3	Annotate <u>T</u> ools <u>H</u> el	p Overvie	ew 🔍 R1	• R2 • D1	• R3	• D2 ×	• A1	•		0 X
	g: e: e0	i Overview i Overvi Overview i Overview i Overview i Overview i Overview i	w RI vull duplex). 06:21.146: %CDP-4 vull duplex). 17:19.625: %CDP-4 vull duplex). 19:13.509: %CDP-4 vull duplex). 101.13.509: %CDP-4 vull duplex). 101.40.16.25: %CDP-4 vull duplex). nd vull duplex). 101.40.16.25: %CDP-4 vull duplex). nd vull duplex). 0.4.132 verface default interface Ethern 0.10.0 0.0.0.252 0.016.0.0.0.25 0.102.0 0.0.122 section %pv6 0.102.0 0.0.122 section %pv6 1.102.254 4.0.4.232 0.05.132 0.05.132 verface 101.234 0.04.6.32 verface 10.102.254 0.05.132 0.05.132 0.05.132 0.05.132 0.05.132 0.05.132 0.05.6.132	• R2 • D1 -DUPLEX_MISMATCH: duplex -DUPLEX_MISMATCH: duplex -DUPLEX_MISMATCH: duplex in ospf -CONFIG_I: Configured from et1/0 is area 0 is area 0 router et1/1 - -DUPLEX_MISMATCH: duplex	R3 mismatch discovered mismatch discovered m console by consol m console by consol	D2 ×	• A1 1/1 (not full 1/1 (not full 4 1/1 (not full	duplex), wi duplex), wi duplex), wi duplex), wi	th R3 GigabitEt th R3 GigabitEt th R3 GigabitEt	× 01 00 002 03 05 077 09
		solarwinds	Solar-PuTTY free	tool			© 2019 SolarWind	s Worldwide, LL	.C. All rights reserved	а. ".

Configuración IP SLA D1 en GNS3

conf t ip sla 4 icmp-echo 10.02.10.1 frequency 5 exit track 6 ip sla 6 delay down 10 up 15 exit track 4 ip sla 4 delay down 10 up 15 exit track 6 ip sla 6 delay down 10 up 15 exit

Figura 40. Configuración IP SLA D1 en GNS3

e <u>E</u> dit <u>V</u> iew	Control Node Annotate Too	ols <u>H</u> elp	Overview	• R1	• R2	• D1	× • R3	• D2	A1	Ð	_	• :	×
-	🕓 🔣 >_ 🕨	C	hernet1/0 (full	duplex).									^
			*Nov 29 23:15:52 hernet1/0 (full	.241: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	
			*Nov 29 23:16:49 hernet1/0 (full D1#	.411: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	01 00 02
		RI	*Nov 29 23:17:44 hernet1/0 (full D1#	.790: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	03 05
		g1/0	*Nov 29 23:18:36 hernet1/0 (full D1#	.645: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	07 09
		e1/1	*Nov 29 23:19:29 hernet1/0 (full D1#	.318: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	
J	PC1	en (1)	*Nov 29 23:20:26 hernet1/0 (full	.693: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	
	e0	*	Nov 29 23:21:19 hernet1/0 (full D1#conf t	.068: %CDP-4 duplex).	-DUPLEX_MISMATCH:					l duplex),		GigabitEt	
			Enter configurat D1(config)#ip sl	ion commands a 4	, one per line.								
2			D1(config-ip-sla D1(config-ip-sla D1(config-ip-sla	-echo)#frequ -echo)#exit	iency 5								
		DC:	D1(config)#track D1(config-track) D1(config-track)	#delay down #exit									
		VPC	D1(config)#track D1(config-track)	#delay down									
			D1(config)#track	#delay down	10 up 15								
			D1(config-track) D1(config)#	#exit									~
			solarwinds ₹	Solar-PuTTY free	tool				2019 SolarWir	nds Worldwide	e, LLC. All r	ights reserved	d.
4									+				

Configuración IP SLA D2 en GNS3

conf t ip sla 4 icmp-echo 10.30.11.1 frequency 5 ip sla 6 icmp-echo 2001:DB8:100:1011::1 frequency 5 ip sla schedule 4 life forever start-time now ip sla schedule 6 life forever start-time now track 4 ip sla 4 delay down 10 up 15 track 6 ip sla 6 delay down 10 up 15

Figura 41. Configuración IP SLA D1 en GNS3

Configuración HSRPv2 D1 en GNS3

conf t interface vlan 100 standby version 2 standby 104 ip 10.27.100.254 standby 104 priority 150 standby 104 preempt standby 104 track 4 decrement 60 exit interface vlan 101 standby version 2 standby 114 ip 10.27.101.254 standby 114 preempt standby 114 track 4 decrement 60 exit interface vlan 102 standby version 2 standby 124 ip 10.27.102.254 standby 124 priority 150 standby 124 preempt standby 124 track 4 decrement 60 exit interface vlan 100 standby 106 ipv6 autoconfig

standby 106 priority 150 standby 106 preempt standby 106 track 6 decrement 60 exit interface vlan 101 standby 116 ipv6 autoconfig standby 116 preempt standby 116 track 6 decrement 60 exit interface vlan 102 standby 126 ipv6 autoconfig standby 126 priority 150 standby 126 preempt standby 126 track 6 decrement 60 exit

Figura 42. Configuración HSRPv2 D1 en GNS3

Configuración HSRPv2 D2 en GNS3

conf t interface vlan 100 standby version 2 standby 104 ip 10.27.100.254 standby 104 preempt standby 104 track 4 decrement 60 exit interface vlan 101 standby version 2 standby 114 ip 10.27.101.254 standby 114 priority 150 standby 114 preempt standby 114 track 4 decrement 60 exit interface vlan 102 standby version 2 standby 124 ip 10.27.102.254 standby 124 preempt standby 124 track 4 decrement 60 exit interface vlan 100 standby 106 ipv6 autoconfig standby 106 preempt standby 106 track 6 decrement 60 exit interface vlan 101 standby 116 ipv6 autoconfig standby 116 priority 150 standby 116 preempt standby 116 track 6 decrement 60 exit interface vlan 102 standby 126 ipv6 autoconfig standby 126 preempt standby 126 track 6 decrement 60 exit

Figura 43. Configuración HSRPv2 D2 en GNS3

<u>F</u> ile <u>E</u> dit	View Control Node Annotate	<u>T</u> ools <u>H</u> elp	Overview	• R1	• R2	• D1	• R3	• D2 ×	• A1	I ⊕	_ = ×	
	₽ 🛈 🔣 >_ ▶		*Nov 29 23:43:50 hernet1/0 (full	0.185: %CDP-4- duplex).	DUPLEX_MISMATCH: d	uplex mismat	ch discovered	on Ethernet	1/1 (not full d	luplex), with F	R3 GigabitEt	^
	PC1 VPCS e0	g1/0 e1/1 e2/3	D2# D2# Thex 29 23:44:47 hernet1/0 (full) D2#conft Enter configural D2(config:if)st D2(config:if)st	<pre>idop(x); i <pre>// (XODP-4- duplex); eion commands; face vlan 100 tandby 104 ip tandby 104 ip tandby 104 pre- tandby 104 pre- tandby 104 pre- tandby 114 pre- tandby 124 pre- tandby 124 pre- tandby 124 pre- axit</pre></pre>	DUPLEX_MISMATCH: d one per line. En 2 10.27.100.254 empt 10.27.100.254 empt ck 4 decrement 60 -STATECHANGE: Viar 2 10.27.101.254 empt ck 4 decrement 60 -STATECHANGE: Viar 2 -STATECHANGE: Viar 5-STATECHANGE: Viar 5-STATECHANGE: Viar	Auplex mismat nd with CNTL/ Huplex mismat A101 Grp 114 1000 Grp 104 Auplex mismat	ch discovered Z. ch discovered state Listen state Speak - cch discovered state Speak -	on Ethernet -> Active -> Standby on Ethernet -> Standby		uplex), with 6 Nuplex), with 6	83 GigabitEt 83 GigabitEt 83 GigabitEt	01 00 03 05 07 09
			solarwinds	Solar-PuTTY free t	lool				© 2019 SolarWinds	Worldwide, LLC. A	II rights reserved	

Comando de verificación D1

show run | section ip sla show standby brief

Figura 44. Comando de verificación D1 en GNS3

FINCOR_Skills - GNS3 File Edit View Control Node Annotate Tools Help	: Overview • R1 • R2	D1 × R3 D2	• A1 (+) - □	×
Image: Contract of the second seco	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	102 Grp 126 state Active -> Speak 102 Grp 126 state Active -> Speak 102 Grp 126 state Speak -> Standby uplex mismatch discovered on Etherne ed from console by console preempt. Standby Virtual IP 10.27.100.2 10.27.100.754 10cal 19.27.100.74 10cal 10.27.107.254 10cal 10.27.107.254	ti/1 (not full duplex), with R1 Gigabiti t1/1 (not full duplex), with R1 Gigabiti t1/1 (not full duplex), with R1 Gigabiti t1/1 (not full duplex), with R1 Gigabit	Et 01 00 02 03 05 05 09
	solarwinds Solar-PuTTY free tool		© 2019 SolarWinds Worldwide, LLC. All rights reser	rved.
4			•	

Comando de verificación D2

show run | section ip sla show standby brief

Figura 45. Comando de verificación D1 en GNS3

CONCLUSIONES

Los modelos de simulación propuestos están integrados a un contexto específico, los cuales son tomados del mundo real. Las actividades pueden estar relacionadas con un caso, un juego de roles o una simulación, el cual se utilizará para el aprendizaje de conocimientos, habilidades y actitudes que permite apropiar las temáticas relacionadas con los principios básicos de la red y los protocolos de enrutamiento para una red empresariales LAN y WAN divide los grupos de usuarios de la red de una red física real en segmentos de redes lógicas.

En cuanto a la solución de los escenarios propuestos se resolvió los problemas de direccionamiento a través de la verificación detallada de la tipo de redes, en donde se consideraran las causas probables de la falla, se propone una solución donde se verifica que la solución dada haya resuelto el problema, de igual manera se evidencia las habilidades de integración en cuanto a configuración de direccionamiento y su verificación en cuanto a conectividad.

Los protocolos de enrutamiento utilizados en este escenario OSPF y BGP son los más comunes que se pueden encontrar en un entorno real, muchas organizaciones utilizan el OSPF para enrutar como protocolo interno porque permite que se conozca toda la red a través de la tabla de enrutamiento de cada router evitando loops, también actualizan automáticamente las tables con cualquier cambio en la topología; el BGP para interconectar sistemas autónomos.

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