EVALUACIÓN PRUEBA DE HABILIDADES PRACTICAS CCNA

HEYMER ALIRIO BUSTOS MORENO

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD

ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI

INGENIERÍA ELECTRONICA

2022

EVALUACIÓN PRUEBA DE HABILIDADES PRACTICAS CCNA

HEYMER ALIRIO BUSTOS MORENO

Diplomado de profundización cisco
Diseño e implementación de soluciones integradas LAN / WLAN

Tutor

JUAN ESTEBAN TAPIAS

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA - UNAD

ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI

INGENIERÍA ELECTRONICA

Puerto Boyacá

2022

Nota de aceptación

Firma del presidente del jurado

Firma del jurado

Firma del jurado

Puerto Boyacá, 21 de noviembre de 2022

Contenido

Lista de tablas

Listado de figura

GLOSARIO

- BGP: Protocolo de puerta de enlace fronteriza. Protocolo de enrutamiento entre dominios que reemplaza a EGP. BGP intercambia información de accesibilidad con otros sistemas BGP. Está definido por RFC 1163.

- NTP: Es un protocolo de Internet para sincronizar los relojes de los sistemas informáticos a través del enrutamiento de paquetes en redes con latencia variable. NTP utiliza UDP como su capa de transporte, usando el puerto 123. Está diseñado para resistir los efectos de la latencia variable.

- OSPF: Primero, abra el camino más corto. Algoritmo de enrutamiento IGP jerárquico de estado de enlace propuesto como sucesor de RIP en la comunidad de Internet. Las características de OSPF incluyen enrutamiento de menor costo, enrutamiento de múltiples rutas y equilibrio de carga. OSPF se derivó de una versión anterior del protocolo IS-IS.

- VLAN: LAN virtual. Grupo de dispositivos en una o más LAN que están configurados (usando software de administración) para que puedan comunicarse como si estuvieran conectados al mismo cable, cuando en realidad están ubicados en varios segmentos de LAN diferentes. Debido a que las VLAN se basan en conexiones lógicas en lugar de físicas, son extremadamente flexibles.

- STP: Par trenzado blindado. Medio de cableado de dos pares utilizado en una variedad de implementaciones de red. El cableado STP tiene una capa de aislamiento blindado para reducir la EMI

RESUMEN

En esta actividad relacionada con la prueba de habilidades, configuraremos una red para que haya accesibilidad general de extremo a extremo, para que los hosts tengan soporte de puerta de enlace predeterminada confiable, y para que los protocolos OSPF y BGP configurados estén operativos dentro de la parte correspondiente a la “Red de la empresa” en la topología. Todas las configuraciones ejecutadas en esta actividad serán verificadas de acuerdo con la guía de trabajo y las especificaciones dadas

ABSTRACT

In this related activity to the skills test, we will configure a network so that there is general end-to-end accessibility, so that hosts have reliable default gateway support, and so that configured OSPF and BGP protocols are operational within of the part corresponding to the “Company Network” in the topology. All the configurations executed in this activity will be verified according to the work guide and the given specifications

INTRODUCCION

En esta etapa del curso presentaremos un adelanto de las actividades de evaluación de nuestro programa que ya han sido resueltas y buscaremos identificar competencias y habilidades que se han ido adquiriendo durante el transcurso del curso. Poner a prueba las habilidades adquiridas en el trabajo realizado y ser capaz de resolver problemas relacionados con diversos aspectos del Networking.
Para esta actividad se asignarán actividades a realizar en un lugar remoto y se ejecutará un software, el cual será la principal herramienta para realizar los procesos solicitados por la guía y de esta manera poder documentar la solución correspondiente.
Finalmente se realiza la configuración de cada uno de los dispositivos, se presentará un informe con la información detallada y se adjunta la configuración realizada.

ESCENARIO 1

Topology
Considering the following image:

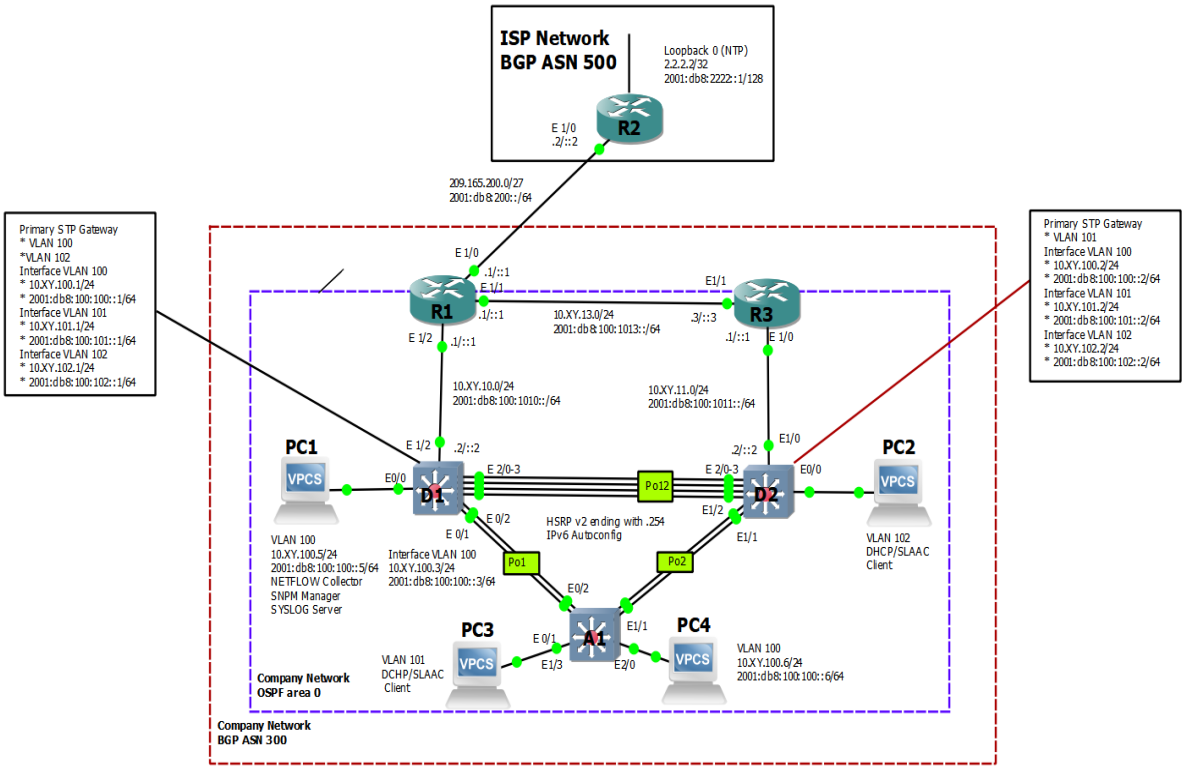


Figure 1. Topology representing scenario 1. Fuente Autor

Addressing Table

Tabla 1 Tabla de direccionamiento IP para topología

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	10.95.10.1/24	2001:db8:100:1010::1/64	fe80::1:2
	E1/1	10. 95.13.1/24	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. 95.11.1/24	2001:db8:100:1011::1/64	fe80::3:2
	E1/1	10. 95.13.3/24	2001:db8:100:1013::3/64	fe80::3:3
D1	E1/2	10. 95.10.2/24	2001:db8:100:1010::2/64	fe80::d1:1
	VLAN 100	10. 95.100.1/24	2001:db8:100:100::1/64	fe80::d1:2
	VLAN 101	10.95.101.1/24	2001:db8:100:101::1/64	fe80::d1:3
	VLAN 102	10.60.102.1/24	2001:db8:100:102::1/64	fe80::d1:4
D2	E1/0	10.95.11.2/24	2001:db8:100:1011::2/64	fe80::d2:1
	VLAN 100	10.95.100.2/24	2001:db8:100:100::2/64	fe80::d2:2
	VLAN 101	10.95.101.2/24	2001:db8:100:101::2/64	fe80::d2:3
	VLAN 102	10.95.102.2/24	2001:db8:100:102::2/64	fe80::d2:4

Device	Interface	IPv4 Address	IPv6 Address	IPv6 Link-Local
A1	VLAN 100	10.95.100.3/23	2001:db8:100:100::3/64	fe80::a1:1
PC1	NIC	10.95.100.5/24	2001:db8:100:100::5/64	EUI-64
PC2	NIC	DHCP	SLAAC	EUI-64
PC3	NIC	DHCP	SLAAC	EUI-64
PC4	NIC	10.95.100.6/24	2001:db8:100:100::6/64	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.

Devices utiliced

- 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)

Build the Network and Configure Basic Device Settings and Interface Addressing

Cable the network as shown in the topology.

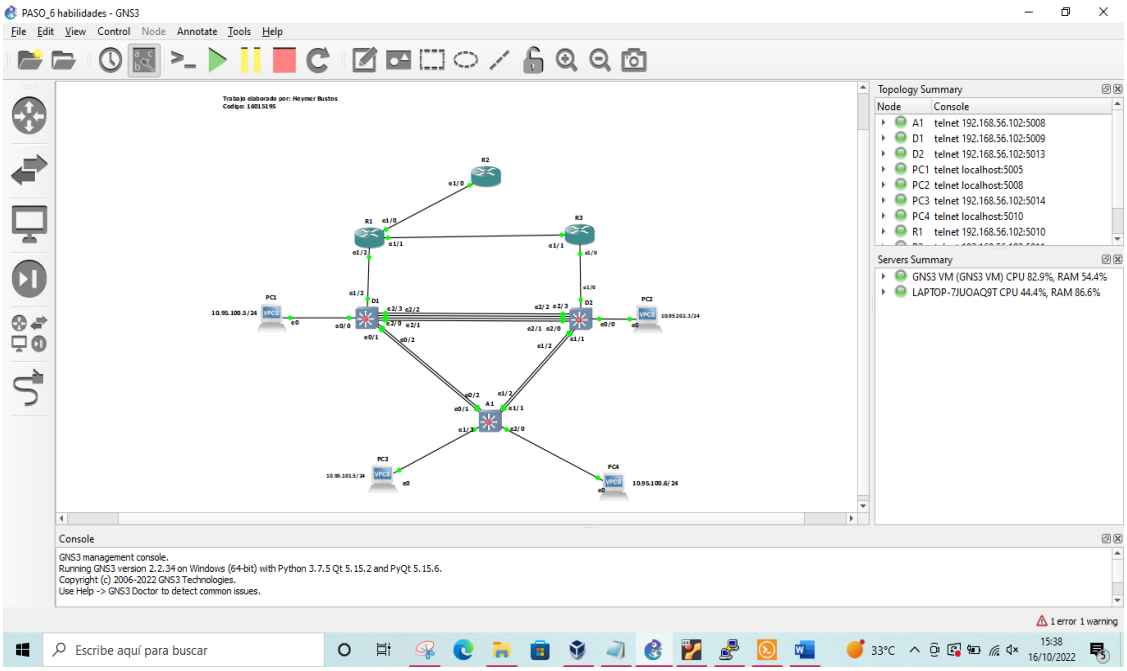


Figure 2. The previous image shows the connection between the different devices based on the instructions given.

Configure basic settings for each device.

Router R1

Tabla 2 Asignacion configuraciones básicas

```
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 10.95.10.1 255.255.255.0
 ipv6 address fe80::1:2 link-local
 ipv6 address 2001:db8:100:1010::1/64
 no shutdown
 exit
interface e1/1
 ip address 10.95.13.1 255.255.255.0
 ipv6 address fe80::1:3 link-local
 ipv6 address 2001:db8:100:1013::1/64
 no shutdown
      exit
```

The previous code corresponds to the programming of the R1 router where the name of the device, the interfaces, the IP addresses, among others, are changed.

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
```

The previous code corresponds to the programming of the R2 router where the name of the device, the interfaces, the IP addresses, among others, are changed.

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 10.95.11.1 255.255.255.0
 ipv6 address fe80::3:2 link-local
 ipv6 address 2001:db8:100:1011::1/64
 no shutdown
 exit
interface e1/1
```

```
ip address 10.95.13.3 255.255.255.0
ipv6 address fe80::3:3 link-local
ipv6 address 2001:db8:100:1010::2/64
no shutdown
exit
```

The previous code corresponds to the programming of the R3 router where the name of the device, the interfaces, the IP addresses, among others, are changed.

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 10.95.10.2 255.255.255.0
 ipv6 address fe80::d1:1 link-local
 ipv6 address 2001:db8:100:1010::2/64
 no shutdown
 exit
interface vlan 100
 ip address 10.95.100.1 255.255.255.0
 ipv6 address fe80::d1:2 link-local
 ipv6 address 2001:db8:100:100::1/64
 no shutdown
 exit
interface vlan 101
 ip address 10.95.101.1 255.255.255.0
 ipv6 address fe80::d1:3 link-local
 ipv6 address 2001:db8:100:101::1/64
 no shutdown
 exit
interface vlan 102
 ip address 10.95.102.1 255.255.255.0
 ipv6 address fe80::d1:4 link-local
 ipv6 address 2001:db8:100:102::1/64
 no shutdown
 exit
ip dhcp excluded-address 10.60.101.1 10.60.101.109
ip dhcp excluded-address 10.60.101.141 10.60.101.254
ip dhcp excluded-address 10.60.102.1 10.60.102.109
ip dhcp excluded-address 10.60.102.141 10.60.102.254
ip dhcp pool VLAN-101
 network 10.95.101.0 255.255.255.0
 default-router 10.95.101.254
```

```
 exit
ip dhcp pool VLAN-102
 network 10.95.102.0 255.255.255.0
 default-router 10.95.102.254
 exit
interface range e0/0-3,e1/0-1,e1/3,e2/0-3,e3/0-3
 shutdown
  exit
```

In the previous Code, it corresponds to the programming of switch D1, in which the name of the device, the warning notice, the name of each of the VLANs, the IP addresses, the Ethernet interfaces, among others, are configured.

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 10.95.11.2 255.255.255.0
 ipv6 address fe80::d1:1 link-local
 ipv6 address 2001:db8:100:1011::2/64
 no shutdown
 exit
interface vlan 100
 ip address 10.95.100.2 255.255.255.0
 ipv6 address fe80::d2:2 link-local
 ipv6 address 2001:db8:100:100::2/64
 no shutdown
 exit
interface vlan 101
 ip address 10.95.101.2 255.255.255.0
 ipv6 address fe80::d2:3 link-local
 ipv6 address 2001:db8:100:101::2/64
 no shutdown
 exit
interface vlan 102
 ip address 10.95.102.2 255.255.255.0
 ipv6 address fe80::d2:4 link-local
 ipv6 address 2001:db8:100:102::2/64
 no shutdown
 exit
ip dhcp excluded-address 10.95.101.1 10.60.101.209
```

```
ip dhcp excluded-address 10.95.101.241 10.60.101.254
ip dhcp excluded-address 10.95.102.1 10.60.102.209
ip dhcp excluded-address 10.95.102.241 10.60.102.254
ip dhcp pool VLAN-101
 network 10.95.101.0 255.255.255.0
 default-router 10.95.0.101.254
 exit
ip dhcp pool VLAN-102
 network 10.95.102.0 255.255.255.0
 default-router 10.95.102.254
 exit
 interface range e0/0-3,e1/1-3,e2/0-3,e3/0-3
 shutdown
  exit
```

In the previous Code, it corresponds to the programming of switch D2, in which the name of the device, the warning notice, the name of each of the VLANs, the IP addresses, the Ethernet interfaces, among others, are configured.

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 10.95.100.3 255.255.255.0
 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
```

In the previous Code, it corresponds to the programming of switch A1, in which the name of the device, the warning notice, the name of each of the VLANs, the IP addresses, the Ethernet interfaces, among others, are configured.

a. Save the running configuration to startup-config on all devices.

b. Configure PC 1 and PC 4 host addressing as shown in the addressing table. Assign a default gateway address of 10.60.100.254 which will be the HSRP virtual IP address used in Part 4.

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.

Your configuration tasks are as follows:

Tabla 3 Asignacion direccionamiento de host en PC1 y PC4

Task#	Task	Specification	Points
2.1	On all switches, configure IEEE 802.1Q trunk interfaces on interconnecting switch links	Enable 802.1Q trunk links between: • 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. D1 and D2 must provide backup in case of root bridge failure.	Configure D1 and D2 as root for the appropriate VLANs with mutually supporting priorities in case of switch failure.	2
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

Task#	Task	Specification	Points
2.8	Verify local LAN connectivity.	PC1 should successfully ping: • D1: 10.95.100.1 • D2: 10.95.100.2 • PC4: 10.95.100.6 PC2 should successfully ping: • D1: 10.95.102.1 • D2: 10.95.102.2 PC3 should successfully ping: • D1: 10.95.101.1 • D2: 10.95.101.2 PC4 should successfully ping: • D1: 10.95.100.1 • D2: 10.95.100.2 • PC1: 10.95.100.5	1

Switch D1

```
interface range e2/0-3
switchport trunk encapsulation dot1q
switchport mode trunk
switchport trunk native vlan 999
channel-group 12 mode active
no shutdown
exit

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
spanning-tree mode rapid-pvst
spanning-tree vlan 100,102 root primary
spanning-tree vlan 101 root secondary
interface e0/0
switchport mode access
switchport access vlan 100
spanning-tree portfast
no shutdown
exit
 end
```

The previous Code corresponds to the programming of switch D1, in which the different ranges of interfaces used, the encapsulation mode, the Trunk operation mode, the priority VLANs, among others, are configured.

Switch D2.

```
interface range e2/0-3
switchport trunk encapsulation dot1q
switchport mode trunk
switchport trunk native vlan 999
channel-group 12 mode active
no shutdown
exit
interface range e1/1-2
switchport trunk encapsulation dot1q
switchport mode trunk
switchport trunk native vlan 999
```

```
channel-group 2 mode active
no shutdown
exit
spanning-tree mode rapid-pvst
spanning-tree vlan 101 root primary
spanning-tree vlan 100,102 root secondary
interface e0/0
switchport mode access
switchport access vlan 102
spanning-tree portfast
no shutdown
exit
 end
```

The previous Code corresponds to the programming of switch D2, in which the different ranges of interfaces used, the encapsulation mode, the Trunk operation mode, the priority VLANs, among others, are configured.

Switch A1.

```
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 e1/1-2
switchport trunk encapsulation dot1q
switchport mode trunk
switchport trunk native vlan 999
```

```
channel-group 2 mode active
no shutdown
exit
interface e1/3
switchport mode access
switchport access vlan 101
spanning-tree portfast
no shutdown
exit
interface e2/0
switchport mode access
switchport access vlan 100
spanning-tree portfast
no shutdown
exit
end
```

The previous Code corresponds to the programming of switch A1, in which the different ranges of interfaces used, the encapsulation mode, the Trunk operation mode, the priority VLANs, among others, are configured.

Verification interfaces trunk. D1

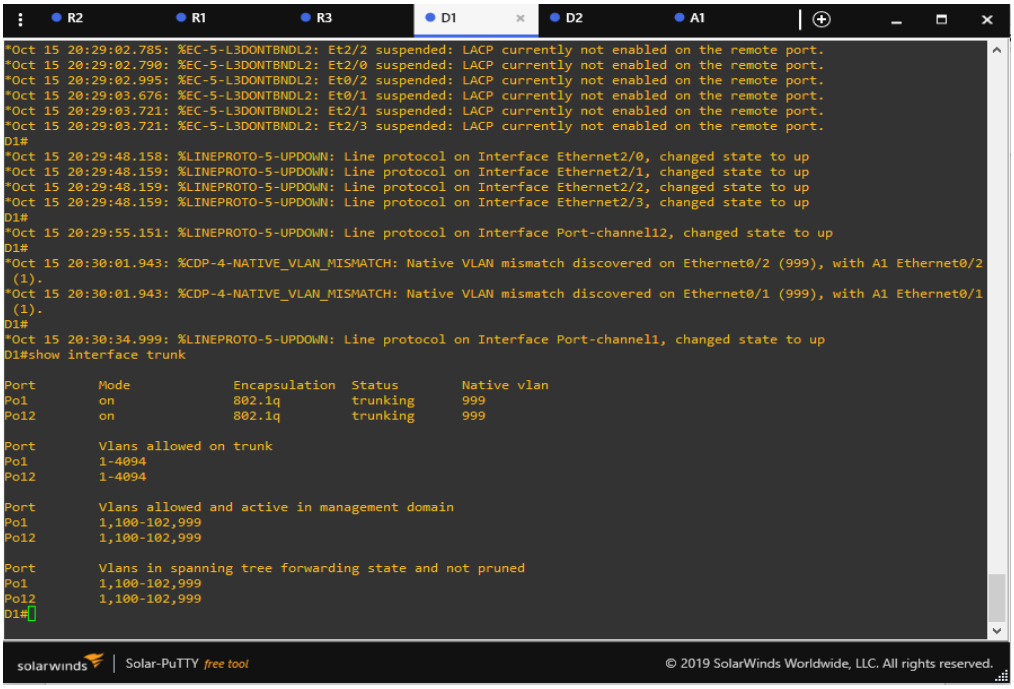


Figure 3. The image shows verification of the interfaces in trunk mode on device D1.

D2.

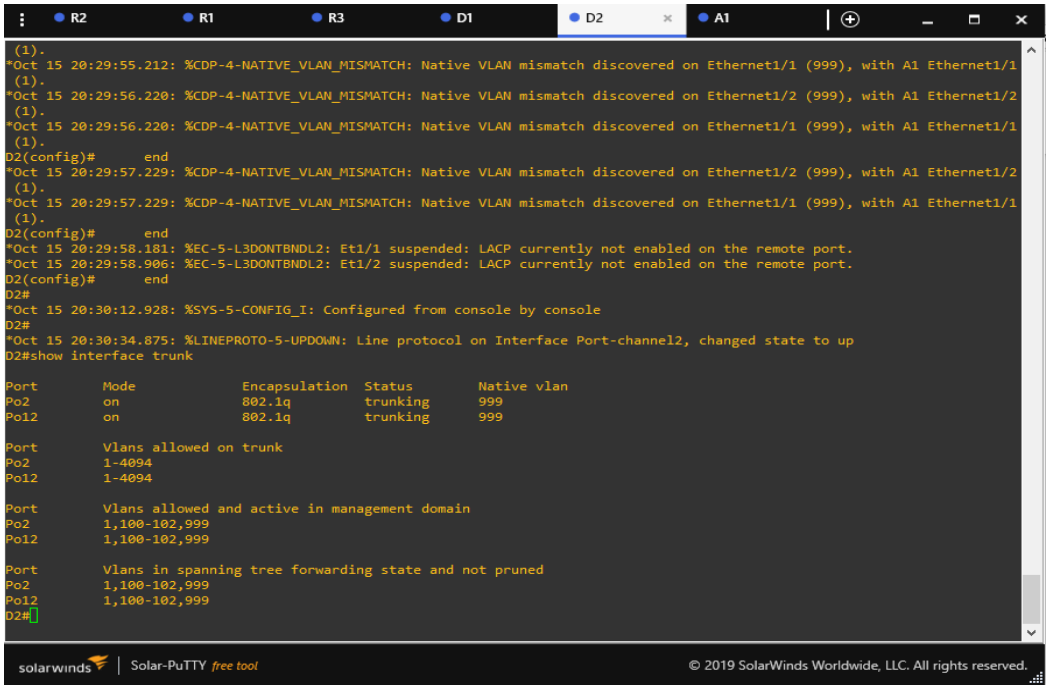


Figure 4. The image shows verification of the interfaces in trunk mode on device D2. A1.

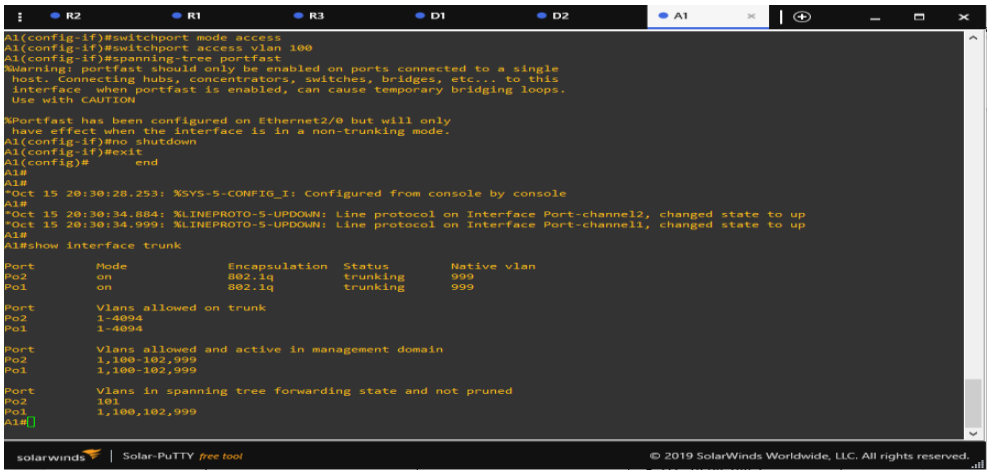


Figure 5. The image shows the verification of the connection to VLANs 100 and 101 and their respective Ethernet ports.

2.8	Verify local LAN connectivity.	PC1 should successfully ping: • D1: 10.95.100.1 • D2: 10.95.100.2 • PC4: 10.95.100.6 PC2 should successfully ping: • D1: 10.95.102.1 • D2: 10.95.102.2 PC3 should successfully ping: • D1: 10.95.101.1 • D2: 10.95.101.2 PC4 should successfully ping: • D1: 10.95.100.1 • D2: 10.95.100.2 PC1: 10.95.100.5

IP configuration on pcs

PC1.

D1: D1: 10.95.100.1

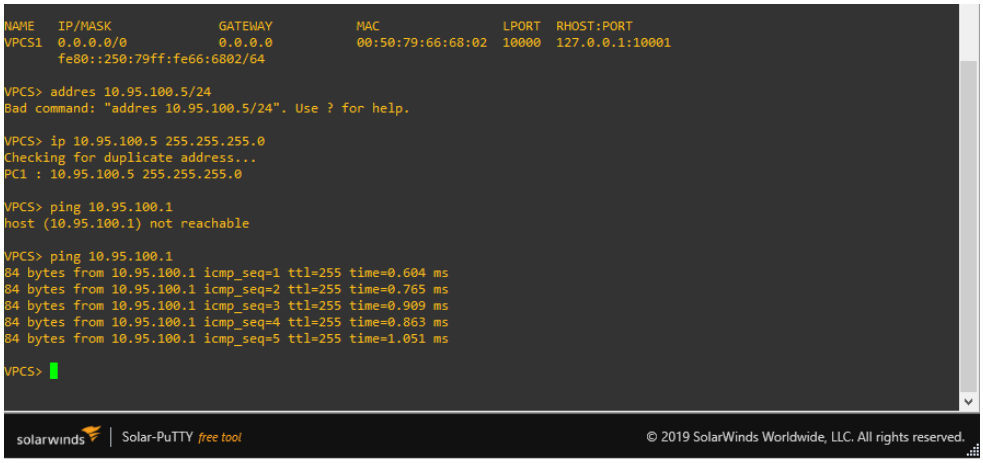


Figure 6. Figures 6, 7 and 8 show the evidence of connection between PC1 and devices D1, D2 and PC4 respectively.

D2: 10.95.100.2

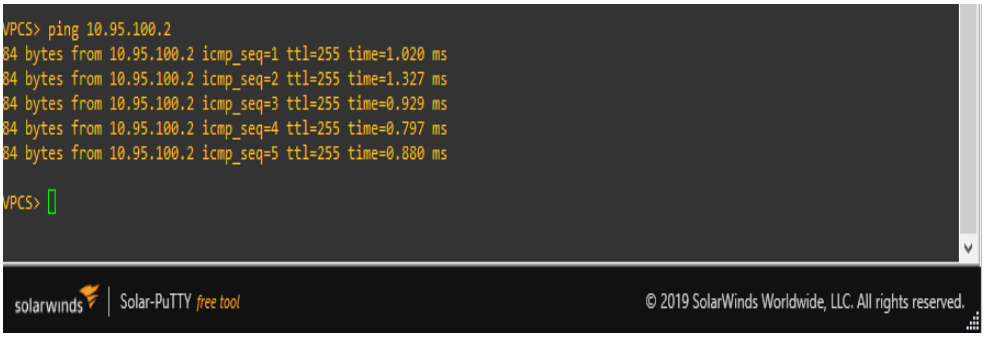


Figure 8. PC2.

- D1:10.95.102.1

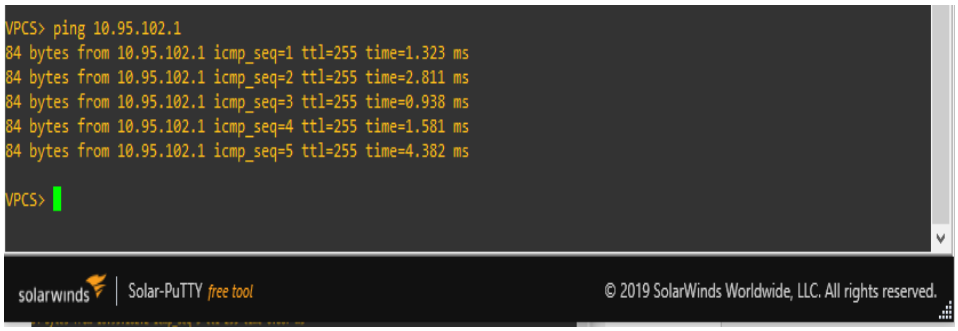


Figure 9. Figures 9 and 10 show the evidence of connection between PC2 and devices D1, D2 respectively.

- D2: 10.95.102.2

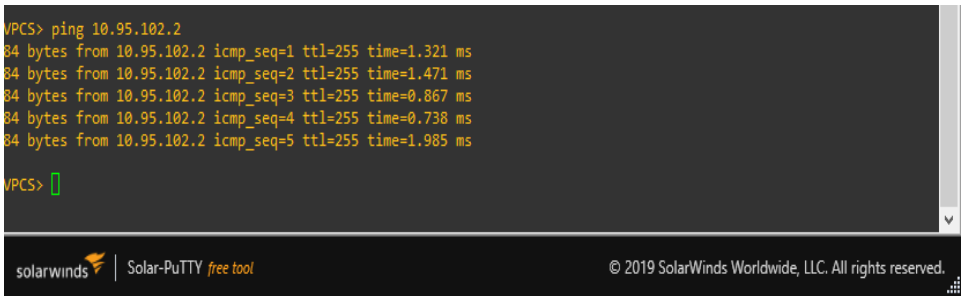


Figure 10.

D1: 10.95.101.1

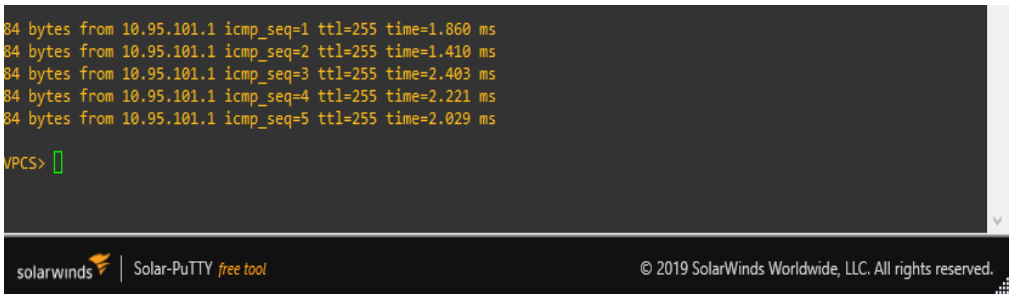


Figure 11. Figures 11 and 12 show the connection evidence between PC3 and devices D1, D2 respectively.

- D2: 10.95.101.2

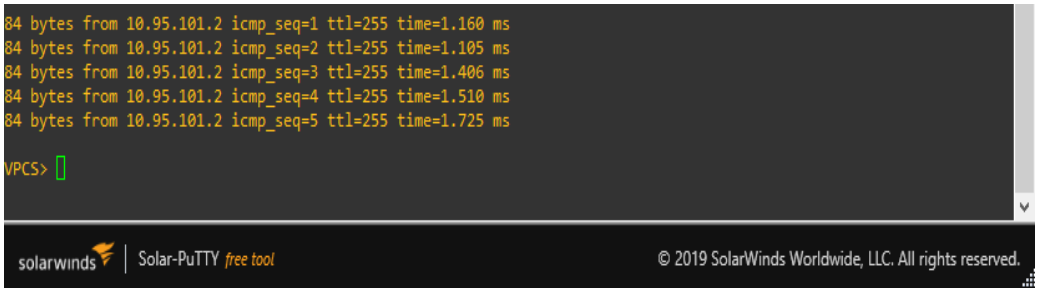


Figure 12. PC4.

D1: 10.95.100.1

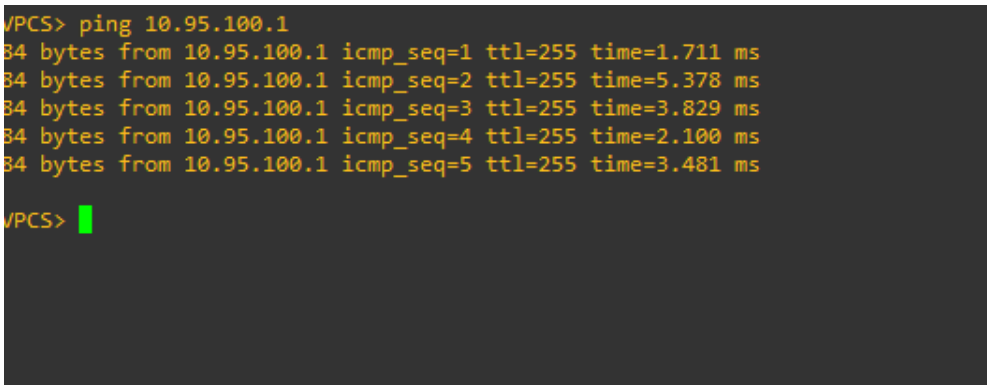


Figure 13. Figures 13 and 14 show the connection evidence between PC4 and devices D1 and PC1 respectively.

- PC1: 10.60.100.5

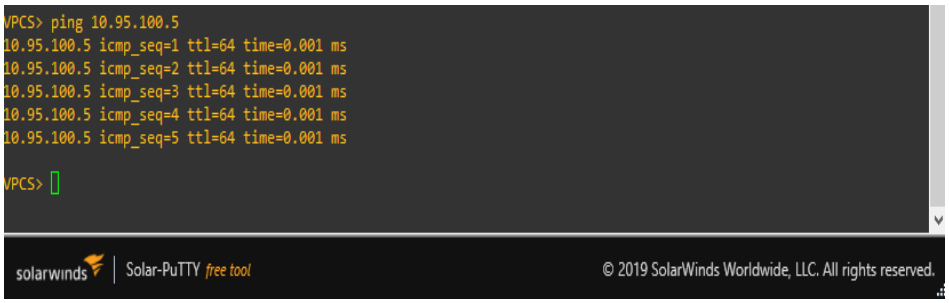
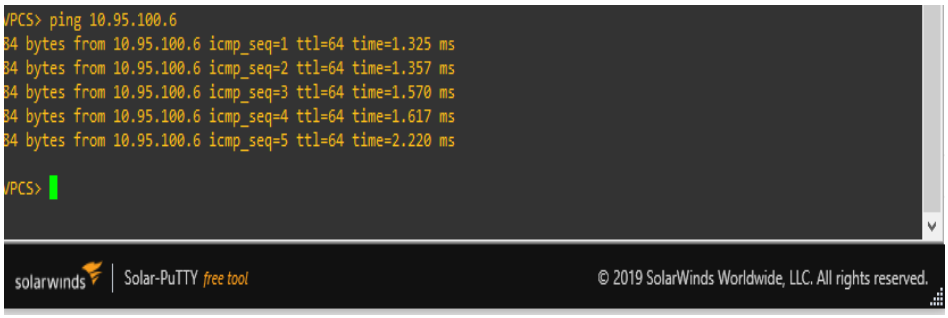


Figure 14


VPCS> ping 10.95.100.6
84 bytes from 10.95.100.6 icmp_seq=1 ttl=64 time=1.325 ms
84 bytes from 10.95.100.6 icmp_seq=2 ttl=64 time=1.357 ms
84 bytes from 10.95.100.6 icmp_seq=3 ttl=64 time=1.570 ms
84 bytes from 10.95.100.6 icmp_seq=4 ttl=64 time=1.617 ms
84 bytes from 10.95.100.6 icmp_seq=5 ttl=64 time=2.220 ms
VPCS>
solarwinds
Solar-PuTTY free tool
© 2019 SolarWinds Worldwide, LLC. All rights reserved.

ESCENARIO 2

En este escenario se continua con la configuración del escenario 1.
El primer paso es configurar los protocolos de enrutamiento, desde los dispositivos, en la tabla 5 se muestran los comandos para dicha configuración.
Tabla 1 Configuración protocolos de enrutamiento

Router R1	Config t router ospf 4 router-id 0.0.4.1 network 10.73.10.0 0.0.0.255 area 0 network 10.73.13.0 0.0.0.255 area 0 default-information originate exit ipv6 router ospf 6 router-id 0.0.6.1 default-information originate exit interface e1/2 ipv6 ospf 6 area 0 exit interface e1/1 ipv6 ospf 6 area 0 exit ip route 10.0.0.0 255.0.0.0 null 0 ipv6 route 2001:db8:100::/48 null 0 router bgp 300

	bgp router-id 1.1.1.1 neighbor 209.165.200.226 remote-as 500 neighbor 2001:db8:200::2 remote-as 500 address-family ipv4 unicast neighbor 209.165.200.226 activate no neighbor 2001:db8:200::2 activate network 10.0.0.0 mask 255.0.0.0 exit-address-family address-family ipv6 unicast no neighbor 209.165.200.226 activate neighbor 2001:db8:200::2 activate network 2001:db8:100::/48 exit-address-family
Router R2	Config t ip route 0.0.0.0 0.0.0.0 loopback 0 ipv6 route ::/0 loopback 0 router bgp 500 bgp router-id 2.2.2.2 neighbor 209.165.200.225 remote-as 300 neighbor 2001:db8:200::1 remote-as 300 address-family ipv4 neighbor 209.165.200.225 activate no neighbor 2001:db8:200::1 activate network 2.2.2.2 mask 255.255.255.255

	network 0.0.0.0 exit-address-family address-family ipv6 no neighbor 209.165.200.225 activate neighbor 2001:db8:200::1 activate network 2001:db8:2222::1/128 network ::/0 exit-address-family
Router R3	Config t router ospf 4 router-id 0.0.4.3 network 10.73.11.0 0.0.0.255 area 0 network 10.73.13.0 0.0.0.255 area 0 exit ipv6 router ospf 6 router-id 0.0.6.3 exit interface e1/0 ipv6 ospf 6 area 0 exit interface e1/1 ipv6 ospf 6 area 0 exit
Switch D1	Config t

	router ospf 4 router-id 0.0.4.131 network 10.73.10.0 0.0.0.255 area 0 network 10.73.100.0 0.0.0.255 area 0 network 10.73.101.0 0.0.0.255 area 0 network 10.73.102.0 0.0.0.255 area 0 passive-interface default no passive-interface e1/2 exit ipv6 router ospf 6 router-id 0.0.6.131 passive-interface default no passive-interface e1/2 exit interface e1/2 ipv6 ospf 6 area 0 exit interface vlan 100 ipv6 ospf 6 area 0 exit interface vlan 101 ipv6 ospf 6 area 0 exit interface vlan 102

	ipv6 ospf 6 area 0 exit
Switch D2	Config t router ospf 4 router-id 0.0.4.132 network 10.73.11.0 0.0.0.255 area 0 network 10.73.100.0 0.0.0.255 area 0 network 10.73.101.0 0.0.0.255 area 0 network 10.73.102.0 0.0.0.255 area 0 passive-interface default no passive-interface e1/0 exit ipv6 router ospf 6 router-id 0.0.6.132 passive-interface default no passive-interface e1/0 exit interface e1/0 ipv6 ospf 6 area 0 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

El siguiente paso es realizar la verificación de la tabla de enrutamiento IPv4 en los dispositivos configurados, con los comandos que se muestran en la figura 14 - 19.

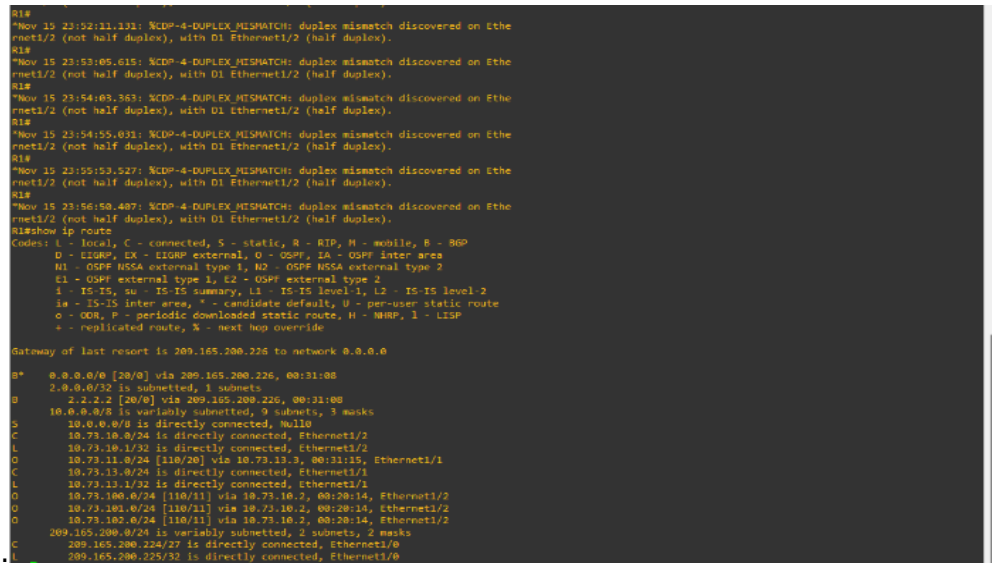


Figura 1 Tabla de enrutamiento en R

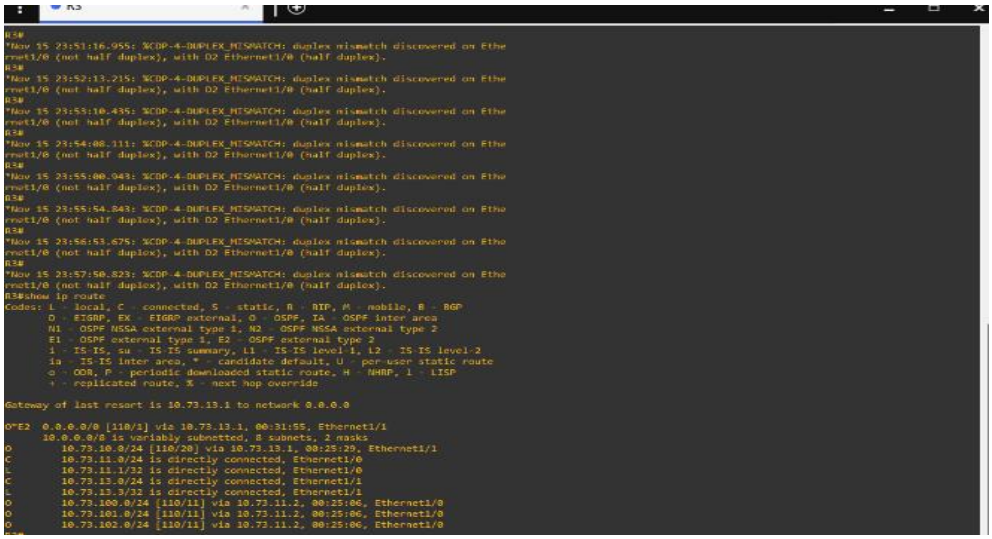


Figura 2 Tabla de enrutamiento en R3

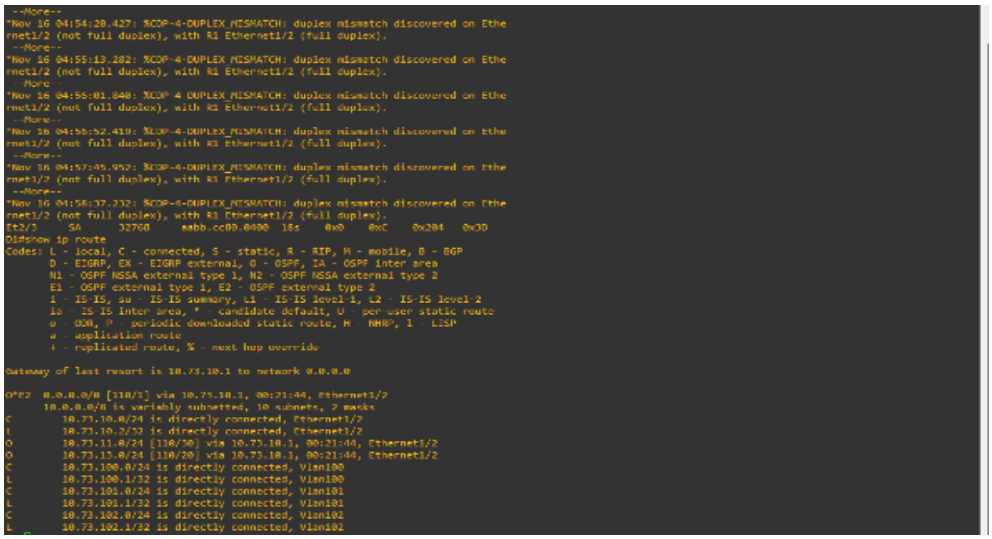


Figura 3 Tabla de enrutamiento en D1

Figura 4 Tabla de enrutamiento en D2

Figura 5 Ping hacia Loopback 0 desde D1

Figura 6 Ping hacia Loopback 0 desde D2

.

Tabla 2 Configuración redundancia de primer salto

Switch D1	config t ip sla 4 icmp-echo 10.73.10.1 frequency 5 exit ip sla 6 icmp-echo 2001:db8:100:1010::1 frequency 5 exit ip sla Schedule 4 life forever start-time now ip sla Schedule 6 life forever start-time now

	track 4 ip sla 4 delay up 10 down 15 exit track 6 ip sla 6 delay up 10 down 15 exit interface vlan 100 standby version 2 standby 104 ip 10.73.100.254 standby 104 priority 150 standby 104 preempt standby 104 track 4 decrement 60 standby 106 ipv6 autoconfig standby 106 priority 150 standby 106 preempt standby 106 track 6 decrement 60 exit interface vlan 101 standby version 2 standby 114 ip 10.73.101.254 standby 114 preempt standby 114 track 4 decrement 60 standby 116 ipv6 autoconfig standby 116 preempt

	standby 116 track 6 decrement 60 exit interface vlan 102 standby version 2 standby 124 ip 10.73.102.254 standby 124 priority 150 standby 124 preempt standby 124 track 4 decrement 60 standby 126 ipv6 autoconfig standby 126 priority 150 standby 126 preempt standby 126 track 6 decrement 60 exit end
Switch D2	Config t ip sla 4 icmp-echo 10.73.11.1 frequency 5 exit ip sla 6 icmp-echo 2001:db8:100:1011::1 frequency 5 exit ip sla schedule 4 life forever start-time now

	ip sla schedule 6 life forever start-time now track 4 ip sla 4 delay up 10 down 15 exit track 6 ip sla 6 delay up 10 down 15 exit interface vlan 100 standby version 2 standby 104 ip 10.73.100.254 standby 104 preempt standby 104 track 4 decrement 60 standby 106 ipv6 autoconfig standby 106 preempt standby 106 track 6 decrement 60 exit interface vlan 101 standby version 2 standby 114 ip 10.73.101.254 standby 114 priority 150 standby 114 preempt standby 114 track 4 decrement 60 standby 116 ipv6 autoconfig standby 116 priority 150

	standby 116 preempt standby 116 track 6 decrement 60 exit interface vlan 102 standby version 2 standby 124 ip 10.73.102.254 standby 124 preempt standby 124 track 4 decrement 60 standby 126 ipv6 autoconfig standby 126 preempt standby 126 track 6 decrement 60 exit end

Después se realiza la verificación de las configuraciones de las SLAs y del Standby en los Switch configurados

Figura 7 Standby en D1

Figura 8 Standby en D2

CONCLUSIONES

Con el desarrollo del presente trabajo se llevaron a cabo una serie de implementaciones donde se ponen a prueba los conceptos adquiridos en el transcurso del diplomado, yendo primeramente de la interpretación de la topología, saber que dispositivos utilizar, que herramienta de simulación adecuar y que imágenes son apropiadas para el desarrollo de la actividad. Es de anexar que el uso de imágenes tipo Dynamips, IOU, QUEMU y la utilización de la máquina virtual para poder emular estos dispositivos fue algo bastante complejo, la activación, el uso de scripts y demás fueron cosas que complicaron el desarrollo de la actividad.

Solamente con el hecho de tener inconvenientes al principio de la prueba da a entender que este mundo de las redes es muy amplio, que no está demás reforzar sobre los conceptos adquiridos y por qué no, pensar a en un futuro poder ejercer como administrador de redes en una gran compañía

BIBLIOGRAFIA

CISCO. (2014). Conceptos de Routing. Principios de Enrutamiento y Conmutación.

CISCO. (2014). Configuración y conceptos básicos de Switching. Principios de Enrutamiento y Conmutación. Recuperado de - courseassets.s3.amazonaws.com/RSE50ES/module2/index.html#2.0.1.1

CISCO. (2014). Enrutamiento entre VLANs. Principios de Enrutamiento y Conmutación. Recuperado de https://static-course-assets.s3.amazonaws.com/RSE50ES/module5/index.html#5.0.1.1

CISCO. (2014). Enrutamiento Estático. Principios de Enrutamiento y Conmutación. Recuperado de https://static-course-assets.s3.amazonaws.com/RSE50ES/module6/index.html#6.0.1.1

CISCO. (2014). VLANs. Principios de Enrutamiento y Conmutación. Recuperado de https://static-course-assets.s3.amazonaws.com/RSE50ES/module3/index.html#3.0.1.1

CISCO. (2017). Asignación de direcciones IP. Fundamentos de Networking. Recuperado de https://static-course-assets.s3.amazonaws.com/ITN50ES/module8/index.html#8.0.1.1

CISCO. (2017). Capa de Aplicación. Fundamentos de Networking. Recuperado de https://static-course-assets.s3.amazonaws.com/ITN50ES/module10/index.html#10.0.1.1

CISCO. (2017). Capa de Transporte. Fundamentos de Networking. Recuperado de https://static-course-assets.s3.amazonaws.com/ITN50ES/module7/index.html#7.0.1.1

CISCO. (2017). Soluciones de Red. Fundamentos de Networking. Recuperado de https://static-course-assets.s3.amazonaws.com/ITN50ES/module11/index.html#11.0.1.1

CISCO. (2017). SubNetting. Fundamentos de Networking. Recuperado de https://static-course-assets.s3.amazonaws.com/ITN50ES/module9/index.html#9.0.1.1

UNAD (2017). PING y TRACER como estrategia en procesos de Networking [OVA]. Recuperado de https://1drv.ms/u/s!AmIJYei-NT1IhgTCtKY-7F5KIRC3

BITACORDABYTE. (18 de Julio de 2017). Configurar DHCP en router CISCO. Obtenido
de https://bitacorabyte.wordpress.com/2017/07/18/configurar-dhcp-en-router-cisco/
activa (HSRP) con un router Cisco. Obtenido de https://thesolving.com/es/sala-deservidores/como-configurar-hot-standby-router-protocol-hsrp-con-un-router-cisco/

CISCO. (11 de Junio de 2020). RSTP: Configuración. Obtenido de
https://ccnadesdecero.com/curso/rstp-configuracion/
NetworkLessons. (s.f.). Multiprotocol BGP (MP-BGP) Configuration. Obtenido de
https://networklessons.com/bgp/multiprotocol-bgp-mp-bgp-configuration