DIPLOMADO DE PROFUNDIZACIÓN CISCO

DISEÑO E IMPLEMENTACIÓN DE SOLUCIONES INTEGRADAS LAN / WAN

EVALUACIÓN – PRUEBA DE HABILIDADES PRÁCTICAS CCNA

Elaborado Por:

JAIRO ENRIQUE GÓMEZ GÓMEZ

C.C: 1052393641

ESCUELA DE CIENCIAS BASICAS TECNOLOGIA E INGENIERIA

UNIVERSIDAD NACIONAL ABIERTA Y A DITANCIA UNAD

DUITAMA

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Presentado A:

GERARDO GRANADOS ACUÑA

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NOTA DE ACEPTACION

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Presidente del jurado

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Jurado

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Jurado

Duitama 11 de diciembre de 2018

Contenido

INTRODUCCIÓN

Sin lugar a duda la importancia de las telecomunicaciones en nuestro tiempo ha ido avanzando a pasos agigantados y vemos gran interés, lo que hace lograr una gran expansión en este ámbito, además de la mano de una empresa como Cisco Systems que es el líder mundial en redes para Internet, se ha permitido avanzar aún más en el área de las telecomunicaciones, es por esto que en asocio con la Universidad Nacional Abierta y a Distancia UNAD, se pretende dar una herramienta adicional en el ámbito profesional a los estudiantes que obtén por la realización del diplomado de profundización cisco (diseño e implementación de soluciones integradas LAN / WAN).

La evaluación denominada "Prueba de habilidades prácticas", forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, la cual busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado. Lo esencial es poner a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

En este documento se presenta la solución de dos escenarios propuestos, los cuales condensan los conceptos teóricos y prácticos adquiridos en los dos módulos desarrollados CCNA1 y CCNA2, los cuales comprenden Introducción a redes y Principios básicos de routing y switching, es indispensable el uso de la herramienta Cisco Packet Tracer Student o GNS3 para logra el desarrollo y comprensión de la prueba en su totalidad

DESARROLLO ESCENEARIO 1
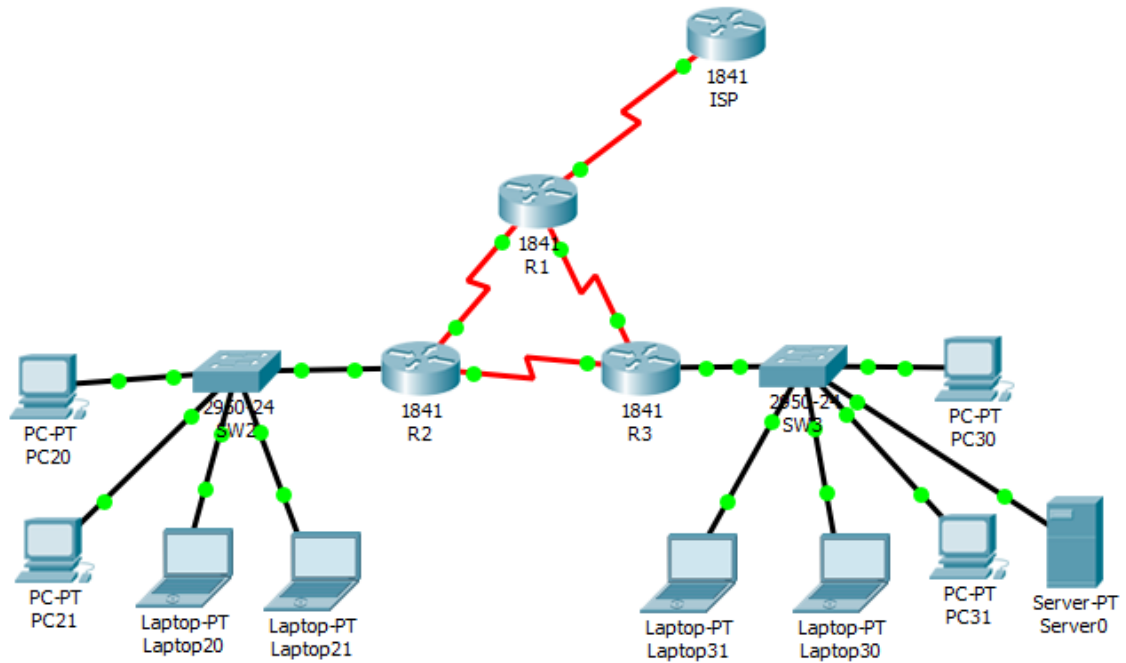
Tabla de direccionamiento

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
R1	Se0/0/0	200.123.211.2	255.255.255.0	N/D
	Se0/1/0	10.0.0.1	255.255.255.252	N/D
	Se0/1/1	10.0.0.5	255.255.255.252	N/D
R2	Fa0/0,100	192.168.20.1	255.255.255.0	N/D
	Fa0/0,200	192.168.21.1	255.255.255.0	N/D
	Se0/0/0	10.0.0.2	255.255.255.252	N/D
	Se0/0/1	10.0.0.9	255.255.255.252	N/D
R3	Fa0/0	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9C0:80F:301	/64	N/D
	Se0/0/0	10.0.0.6	255.255.255.252	N/D
	Se0/0/1	10.0.0.10	255.255.255.252	N/D
SW2	VLAN 100	N/D	N/D	N/D

	VLAN 200	N/D	N/D	N/D
SW3	VLAN1	N/D	N/D	N/D

PC20	NIC	DHCP	DHCP	DHCP
PC21	NIC	DHCP	DHCP	DHCP
PC30	NIC	DHCP	DHCP	DHCP
PC31	NIC	DHCP	DHCP	DHCP
Laptop20	NIC	DHCP	DHCP	DHCP
Laptop21	NIC	DHCP	DHCP	DHCP
Laptop30	NIC	DHCP	DHCP	DHCP
Laptop31	NIC	DHCP	DHCP	DHCP

Tabla de asignación de VLAN y de puertos

Dispositivo	VLAN	Nombre	Interfaz
SW2	100	LAPTOPS	Fa0/2-3
SW2	200	DESTOPS	Fa0/4-5
SW3	1	-	Todas las interfaces

Tabla de enlaces troncales

Dispositivo local	Interfaz local	Dispositivo remoto
SW2	Fa0/2-3	100

Situación

En esta actividad, demostrará y reforzará su capacidad para implementar NAT, servidor de DHCP, RIPV2 y el routing entre VLAN, incluida la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces. Todas las pruebas de alcance deben realizarse a través de ping únicamente.

Solución

1. SW1 VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1.
2. Los puertos de red que no se utilizan se deben deshabilitar.

Dispositivo	VLAN	Nombre	Interfaz
SW3	1	-	Todas las interfaces

- El el SW3 configuramos la vlan 1 y asignamos todos los puertos a la misma

```
SW3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
SW3(config)#vlan 1
SW3(config-vlan)#exit
SW3(config)#interface vlan 1
SW3(config-if)#ex
SW3(config)#in
SW3(config)#interface range fastEthernet 0/1-24
SW3(config-if-range)#switchport access vlan 1
SW3(config-if-range)#ex
SW3(config)#ex
SW3#
%SYS-5-CONFIG_I: Configured from console by console
SW3#show vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- ------------------
-------------
1    default                          active    Fa0/1, Fa0/2,
Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6,
Fa0/7, Fa0/8
                                                Fa0/9, Fa0/10,
Fa0/11, Fa0/12
                                                Fa0/13, Fa0/14,
Fa0/15, Fa0/16
```

Fa0/17, Fa0/18,
Fa0/19, Fa0/20
                                                        Fa0/21, Fa0/22,
Fa0/23, Fa0/24

- Deshabilitamos los puertos que no se van a usar en el SW2

```
SW3(config)#interface range fastEthernet 0/6-23
SW3(config-if-range)#sh
SW3(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down
SW3(config-if-range)#
```

Dispositivo	VLAN	Nombre	Interfaz
SW2	100	LAPTOPS	Fa0/2-3
SW2	200	DESTOPS	Fa0/4-5

- En el SW2 configuramos la vlan 100 y 200 , les asignamos los puertos a las mismas según el cuadro de asignación

```
Switch>enable
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hos
Switch(config)#hostname SW2
SW2(config)#vl
SW2(config)#vlan 100
SW2(config-vlan)#name LAPTOPS
SW2(config-vlan)#exit
SW2(config)#vl
SW2(config)#vlan 200
```

```
SW2(config-vlan)#na
SW2(config-vlan)#name DESTOPS
SW2(config-vlan)#exit
SW2(config)#interface range fastEthernet 0/2-3
SW2(config-if-range)#switchport access vlan 100
SW2(config-if-range)#exit
SW2(config)#interface range fastEthernet 0/4-5
SW2(config-if-range)#switchport access vlan 200
SW2(config-if-range)#exit
SW2(config)#
```

- Deshabilitamos los puertos que no se van a usar en el SW2

```
SW2(config)#interface range fastEthernet 0/6-24
SW2(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/10, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down
```

```
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/22, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/24, changed state to
administratively down
SW2(config-if-range)#
SW2#
%SYS-5-CONFIG_I: Configured from console by console
SW2(config)#
SW2(config)#interface fastEthernet 0/1
SW2(config-if)#switchport mode trunk
SW2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

SW2(config-if)#
```

3. La información de dirección IP R1, R2 y R3 debe cumplir con la tabla 1.

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
R3	Fa0/0	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9C0:80F:301	/64	N/D
	Se0/0/0	10.0.0.6	255.255.255.252	N/D
	Se0/0/1	10.0.0.10	255.255.255.252	N/D

- Asignación de dirección al ISP

```
Router>enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname ISP
ISP(config)#
ISP#
ISP(config)#interface serial 0/0/0
ISP(config-if)#ip address 200.123.211.1 255.255.255.0
ISP(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
ISP(config-if)#
ISP(config-if)#
ISP
%SYS-5-CONFIG_I: Configured from console by console
ISP#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
ISP#
```

- Asignación de direcciones a R1

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
R1	Se0/0/0	200.123.211.2	255.255.255.0	N/D
	Se0/1/0	10.0.0.1	255.255.255.252	N/D
	Se0/1/1	10.0.0.5	255.255.255.252	N/D

```
Router>enable
Router#conf t
Router(config)#hostname R1
R1(config)#
R1#
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface serial 0/0/0
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

R1(config-if)#exit
R1(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up

R1(config)#interface serial 0/1/0
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R1(config-if)#
R1(config-if)#exit
R1(config)#interface serial 0/1/1
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
R1(config-if)#exit
R1(config)#
R1(config)#exit
R1
%SYS-5-CONFIG_I: Configured from console by console

R1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R1#
```

- Asignación de direcciones a R2

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
R2	Fa0/0,100	192.168.20.1	255.255.255.0	N/D
	Fa0/0,200	192.168.21.1	255.255.255.0	N/D
	Se0/0/0	10.0.0.2	255.255.255.252	N/D
	Se0/0/1	10.0.0.9	255.255.255.252	N/D

```
Router>enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#host
Router(config)#hostname R2
R2(config)#
R2(config)#interface fastEthernet 0/0.100
R2(config-subif)#encapsulation dot1Q 100
R2(config-subif)#ip address 192.168.20.1 255.255.255.0

% Configuring IP routing on a LAN subinterface is only allowed if
that
subinterface is already configured as part of an IEEE 802.10, IEEE
802.1Q,
or ISL vLAN.

R2(config-subif)#no shutdown
R2(config-subif)#exit
R2(config)#interface fastEthernet 0/0.200
R2(config-subif)#encapsulation dot1Q 200
R2(config-subif)#ip address 192.168.21.1 255.255.255.0

% Configuring IP routing on a LAN subinterface is only allowed if
that
subinterface is already configured as part of an IEEE 802.10, IEEE
802.1Q,
or ISL vLAN.

R2(config-subif)#no shutdown
R2(config-subif)#exit
R2(config)#interface serial 0/0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R2(config-if)#exit
R2(config)#interface serial 0/0/1
R2(config-if)#ip address 10.0.0.9 255.255.255.252
R2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#exit
R2(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

- Asignación de direcciones a R3

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
R3	Fa0/0	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9C0:80F:301	/64	N/D
	Se0/0/0	10.0.0.6	255.255.255.252	N/D
	Se0/0/1	10.0.0.10	255.255.255.252	N/D

```
Router>enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R3
R3(config)#
R3(config)#interface serial 0/0/0
R3(config-if)#ip add
R3(config-if)#ip address 10.0.0.6 255.255.255.252
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

R3(config)#
R3(config)#interface serial 0/0/0
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0
R3(config)#interface serial 0/0/1
R3(config-if)#ip address 10.0.0.10 255.255.255.252
R3(config-if)#no sh
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

R3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up

R3(config-if)#exit
R3(config)#i
R3(config)#in
R3(config)#interface f
R3(config)#interface fastEthernet 0/0
R3(config-if)#ip ad
R3(config-if)#ip address 192.168.30.1 255.255.255.0
R3(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64
R3(config-if)#no shutdown
R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,
changed state to up

R3(config-if)#ipv6 nd other-config-flag
R3(config-if)#exit
R3(config)#ipv6 unicast-routing
R3(config-if)#end
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
```

4. Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31 deben obtener información IPv4 del servidor DHCP.

- Configuración DHCP en R2

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip dhcp pool LAPTOPS
R2(dhcp-config)#
R2(dhcp-config)#network 192.168.20.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.20.1
R2(dhcp-config)#exit
R2(config)#ip dhcp pool DESTOPS
R2(dhcp-config)#network 192.168.21.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.21.1
R2(dhcp-config)#
```

5. R1 debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública. Asegúrese de que todos los terminales pueden comunicarse con Internet pública (haga ping a la dirección ISP) y la lista de acceso estándar se llama INSIDE-DEVS.

- Configuración de NAT en R1

```
R1#
R1(config)#ip access-list standard INSIDE-DEVS
R1(config-std-nacl)#permit 192.168.20.0 0.0.0.255
R1(config-std-nacl)#permit 192.168.21.0 0.0.0.255
R1(config-std-nacl)#permit 192.168.30.0 0.0.0.255
R1(config-std-nacl)#ex
R1(config)#ip
R1(config)#ip nat inside source list INSIDE-DEVS interface serial
0/0/0 overload
R1(config)#
R1(config)#int
R1(config)#interface serial 0/0/0
R1(config-if)#ip nat outside
R1(config-if)#ex
R1(config)#interface serial 0/1/0
R1(config-if)#ip nat inside
R1(config-if)#ex
R1(config)#interface serial 0/1/1
```

```
R1(config-if)#ip nat inside
R1(config-if)#ex
R1(config)#
```

6. R1 debe tener una ruta estática predeterminada al ISP que se configuró y que incluye esa ruta en el dominio RIPv2.

- Configuracion de RIP V2 en R1

```
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#do show ip route connected
 C   10.0.0.0/30  is directly connected, Serial0/1/0
 C   10.0.0.4/30  is directly connected, Serial0/1/1
 C   200.123.211.0/24  is directly connected, Serial0/0/0

R1(config-router)#network 10.0.0.0
R1(config-router)#network 10.0.0.4
R1(config-router)#network 200.123.211.0
R1(config-router)#default-information originate
R1(config-router)#ex
R1(config)#ip route 0.0.0.0 0.0.0.0 ser
R1(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/0
R1(config)#exit
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 10.0.0.0
R1(config-router)#
R1(config-router)#default-information originate
```

- Configuracion de RIP V2 en R2

```
R2#conf t
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#do show ip route connected
 C   10.0.0.0/30  is directly connected, Serial0/0/0
 C   10.0.0.8/30  is directly connected, Serial0/0/1
 C   192.168.21.0/24  is directly connected, FastEthernet0/0.200
```

```
R2(config-router)#net
R2(config-router)#network 10.0.0.0
R2(config-router)#network 10.0.0.8
R2(config-router)#network 192.168.21.0
R2(config-router)#network 192.168.20.0
R2(config-router)#ex
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router rip
R2(config-router)#network 10.0.0.0
R2(config-router)#network 192.168.20.0
R2(config-router)#network 192.168.21.0
R2(config-router)#
R2(config-router)#default-information originate
```

- Configuracion de RIP V2 en R3

```
R3(config)#router rip
R3(config-router)#ver
R3(config-router)#version 2
R3(config-router)#do sh
R3(config-router)#do show ip route conn
R3(config-router)#do show ip route connected
 C   10.0.0.4/30  is directly connected, Serial0/0/0
 C   10.0.0.8/30  is directly connected, Serial0/0/1
 C   192.168.30.0/24  is directly connected, FastEthernet0/0

R3(config-router)#network 10.0.0.4
R3(config-router)#network 10.0.0.8
R3(config-router)#network 192.168.30.0
R3(config-router)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router rip
R3(config-router)#version 2
R3(config-router)#network 10.0.0.4
R3(config-router)#network 10.0.0.8
R3(config-router)#network 192.168.30.0
R3(config-router)#
R3(config-router)#default-information originate
```

7. R2 es un servidor de DHCP para los dispositivos conectados al puerto FastEthernet0/0.

Desarrollado en punto 4

8. R2 debe, además de enrutamiento a otras partes de la red, ruta entre las VLAN 100 y 200.

Ya se desarrolló en puntos anteriores

9. El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivos en R3 (ping).

```
R3>en
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#access-list 10 deny 192.168.30.5
R3(config)#access-list 10 permit any
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#show access-lists
Standard IP access list 10
10 deny host 192.168.30.5
20 permit any

R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#in
R3(config)#interface f
R3(config)#interface fastEthernet 0/0
R3(config-if)#ip acc
R3(config-if)#ip access-group 10 i
R3(config-if)#ip access-group 10 in
R3(config-if)#
```

10. La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop31, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6.
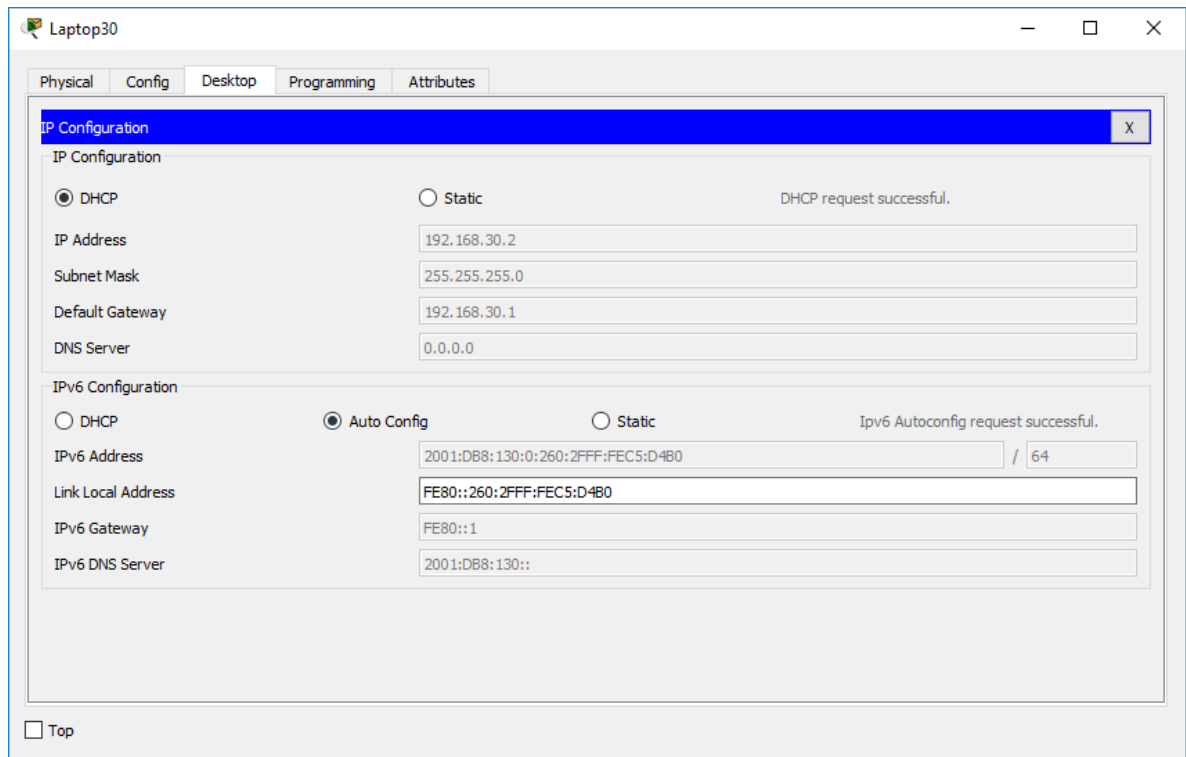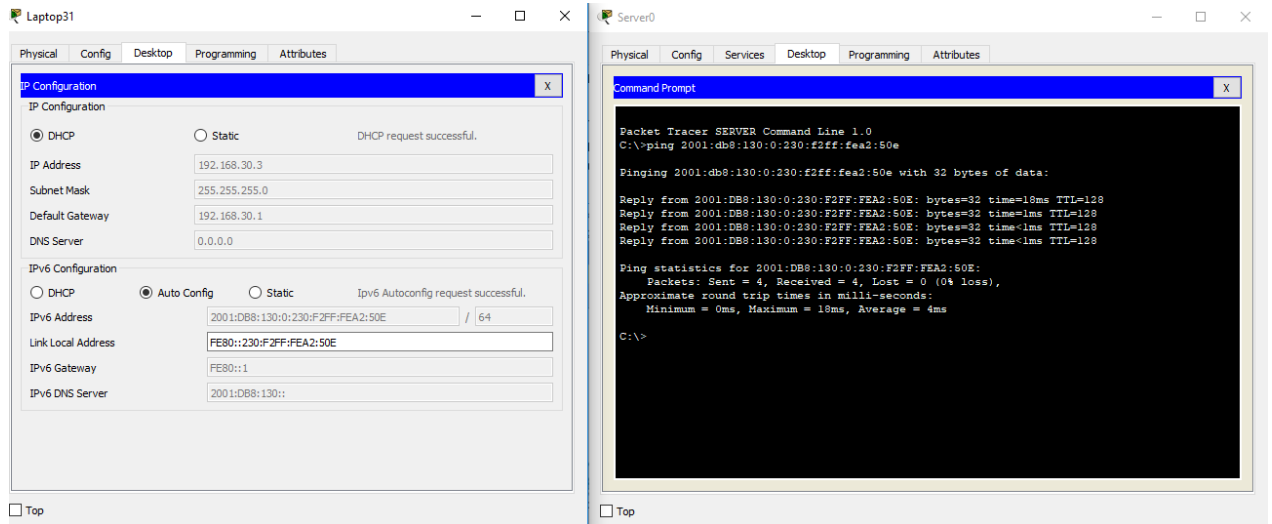

Funciona para todos los equipos

11. La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual- stack).

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#in
R3(config)#interface fastEthernet 0/0
R3(config-if)#ipv6 address fe00::1 link-local
% Invalid link-local address
R3(config-if)#ipv6 address fe80::1 link-local
R3(config-if)#ipv6 nd other-config-flag
R3(config-if)#ipv6 dhcp server ANY
R3(config-if)#exit
R3(config)#ipv6 unicast-routing
R3(config)#ipv6 dhcp pool ANY
R3(config-dhcpv6)#dns-server 2001:db8:130::
R3(config-dhcpv6)#
```

12. R1, R2 y R3 intercambian información de routing mediante RIP versión 2.
13. R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1.
14. Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo el R3 deberían poder hacer IPv6-ping entre ellos y el servidor.

DESARROLLO ESCENARIO 2

Escenario:

Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los lineamientos establecidos para el direccionamiento IP, protocolos de enrutamiento y demás aspectos que forman parte de la topología de red.
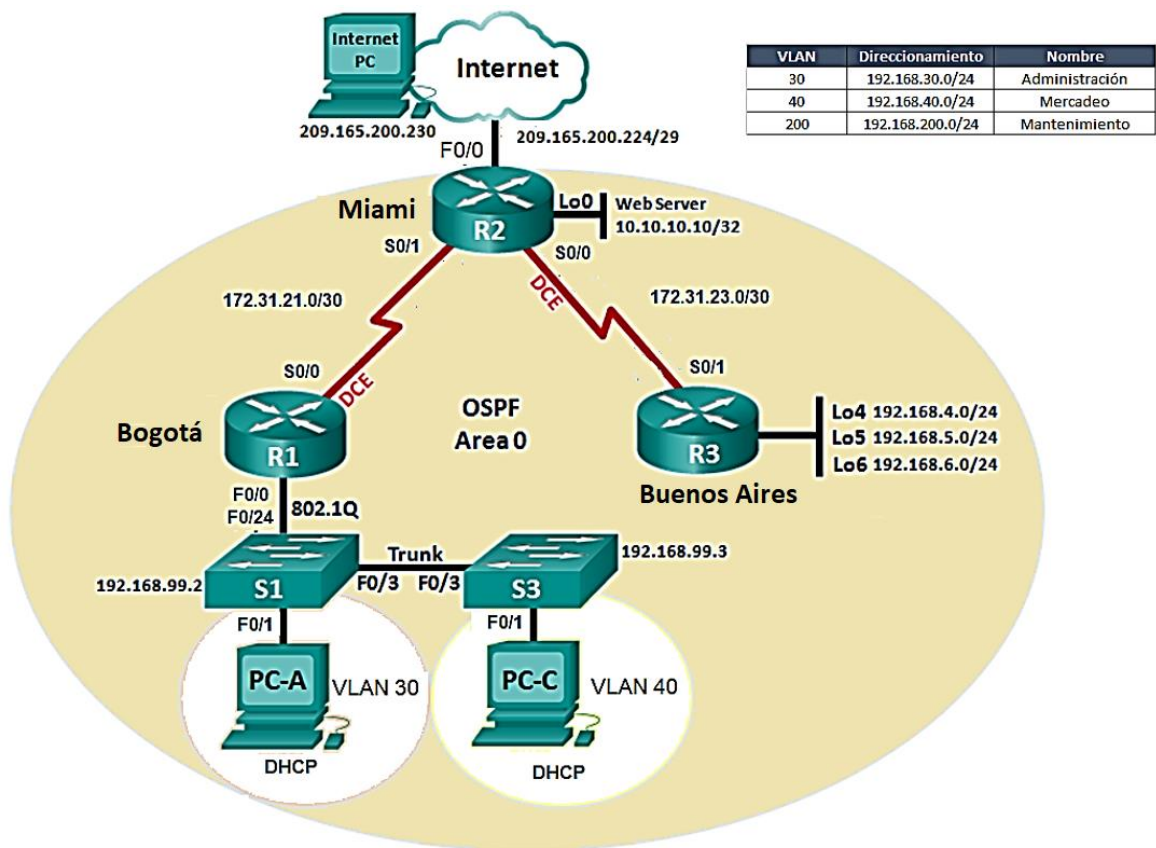
Solución

- **Borramos la configuración de inicio de los routers**

R1 – R2 – R3

```
Router>enable
Router#erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#reload
Proceed with reload? [confirm]
```

- **borramos la configuración de inicio de los switches y también borramos la configuración antigua de las vlan**

S1 – S3

```
Switch>enable
Switch#erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Switch#del
Switch#delete v
Switch#delete vl
Switch#delete vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
%Error deleting flash:/vlan.dat (No such file or directory)
Switch#
```

1. **Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario**

- **Configuración inicial de R1**

```
R1(config)#
R1(config)#no ip domain-lookup
R1(config)#interface serial 0/0/0
R1(config-if)#description connection to R2
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down

R1(config-if)#exit
R1(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/0
%Default route without gateway, if not a point-to-point interface,
may impact performance
R1(config)#
```

- **Configuración inicial de R2**

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#no ip domain-lookup
R2(config)#ip http server
               ^
% Invalid input detected at '^' marker.

R2(config)#
R2(config)#interface serial 0/0/0
R2(config-if)#description conection to R1
R2(config-if)#ip address 172.31.23.2 255.255.255.252
R2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R2(config-if)#exit
R2(config)#interface serial 0/0/1
R2(config-if)#description conection to R3
R2(config-if)#ip address 172.31.21.2 255.255.255.252
```

```
R2(config-if)#clo
R2(config-if)#clock r
R2(config-if)#clock rate 128000
This command applies only to DCE interfaces
R2(config-if)#no sh
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

R2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up

R2(config-if)#exit
R2(config)#in
R2(config)#in
R2(config)#interface g
R2(config)#interface gigabitEthernet 0/0
R2(config-if)#des
R2(config-if)#description connection to ISP
R2(config-if)#ip add
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no s
R2(config-if)#no sh
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0, changed state to up

R2(config)#interface g
R2(config)#interface gigabitEthernet 0/1
R2(config-if)#ip address 10.10.10.1 255.255.255.0
R2(config-if)# description connection WEB SERVER
R2(config-if)#no shutdown
R2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to up
R2(config-if)#exit
```

```
R2(config)#ip route 0.0.0.0 0.0.0.0 gigabitEthernet 0/0
%Default route without gateway, if not a point-to-point interface,
may impact performance
R2(config)#
```

- **Configuración Inicial R3**

```
Router>en
Router#conf t
Router(config)#hostname R3
R3 (config)#no ip domain-lookup
R3 (config)#interface serial 0/0/1
R3 (config-if)#description connection to R2
R3 (config-if)#ip address 172.31.23.2 255.255.255.252
R3 (config-if)#no shutdown

R3 (config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up
R3 (config-if)#exit
R3(config)#interface loopback 4
Router(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4,
R3(config-if)#
R3(config-if)#exit
R3(config)#interface loopback 5
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback5, changed
state to up

R3(config-if)#exit
R3(config)#interface loopback 6
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed
state to up
```

```
R3(config)#interface loopback 4
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#exit
R3(config)#interface loopback 5
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#exit
R3(config)#interface loopback 6
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#

R3(config-if)#exit
R3(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0/1
%Default route without gateway, if not a point-to-point interface,
may impact performance
R3(config)#
```

- **Configuración S1**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#no ip domain-lookup
S1(config)#
```

- **Configuración S3**

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hos S3
S3(config)#no ip domain-lookup
S3(config)#
```

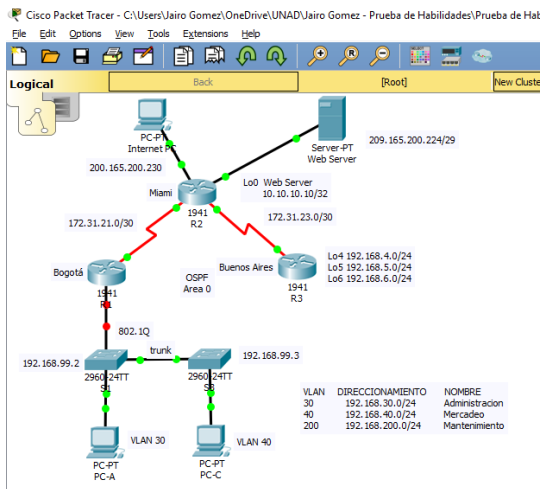- **Verificamos conectividad**

- Configuración IPv4 de PC internet

Configuration Item or Task	Specification
IP Addres	209.165.200.230
Subnet Mask	255.255.255.248
Default Gateway	209.165.200.225

2. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

2.1.   OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

Configuration Item or Task	Specification
Router ID R1	1.1.1.1

```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#rou
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#network 192.168.30.0 0.0.0.255 area 0
R1(config-router)#network 192.168.40.0 0.0.0.255 area 0
R1(config-router)#network 192.168.200.0 0.0.0.255 area 0
R1(config-router)#network 192.168.99.0 0.0.0.255 area 0
R1(config-router)#passive-interface default
R1(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across
all routers.
R1(config-router)#exit
R1(config)#interface serial 0/0/0
R1(config-if)#ban
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
R1(config-if)#
```

Configuration Item or Task	Specification
Router ID R2	5.5.5.5

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#router-id 5.5.5.5
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
R2(config-router)#passive-interface gigabitEthernet 0/1
R2(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across
all routers.
R2(config-router)#exit
R2(config)#interface serial 0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#
```

Configuration Item or Task	Specification
Router ID R3	8.8.8.8

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#router-id 8.8.8.8
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#
04:51:43: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Serial0/0/1
from LOADING to FULL, Loading Done

R3(config-router)#network 192.168.4.0 0.0.3.255 area 0
R3(config-router)#passive-interface loopback 4
R3(config-router)#passive-interface loopback 5
R3(config-router)#passive-interface loopback 6
R3(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
```

```
          Please ensure reference bandwidth is consistent across
all routers.
R3(config-router)#exit
R3(config)#interface serial 0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#ip ospf cost 9500
R3(config-if)#
```

2.2.   Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2

```
R2#show ip ospf neighbor


Neighbor ID     Pri  State         Dead Time  Address       Interface
8.8.8.8           0  FULL/  -      00:00:39   172.31.23.2   Serial0/0/0



R3#show ip ospf neighbor


Neighbor ID     Pri  State         Dead Time  Address       Interface
5.5.5.5           0  FULL/  -      00:00:36   172.31.23.2   Serial0/0/1

R3#
```

- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface

R1

R1#show ip ospf interface

```
Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.21.1/30, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT,
Cost: 9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
    No Hellos (Passive interface)
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
```

```
      Last flood scan length is 1, maximum is 1
      Last flood scan time is 0 msec, maximum is 0 msec
      Suppress hello for 0 neighbor(s)
    R1#
R2
    R2#show ip ospf interface

    Serial0/0/1 is up, line protocol is up
      Internet address is 172.31.21.2/30, Area 0
      Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT,
    Cost: 9500
      Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
      No designated router on this network
      No backup designated router on this network
      Timer intervals configured, Hello 10, Dead 40, Wait 40,
    Retransmit 5
        Hello due in 00:00:05
      Index 1/1, flood queue length 0
      Next 0x0(0)/0x0(0)
      Last flood scan length is 1, maximum is 1
      Last flood scan time is 0 msec, maximum is 0 msec
      Suppress hello for 0 neighbor(s)
    Serial0/0/0 is up, line protocol is up
      Internet address is 172.31.23.2/30, Area 0
      Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT,
    Cost: 647
      Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
      No designated router on this network
      No backup designated router on this network
      Timer intervals configured, Hello 10, Dead 40, Wait 40,
    Retransmit 5
        Hello due in 00:00:02
      Index 2/2, flood queue length 0
      Next 0x0(0)/0x0(0)
      Last flood scan length is 1, maximum is 1
      Last flood scan time is 0 msec, maximum is 0 msec
      Neighbor Count is 1 , Adjacent neighbor count is 1
        Adjacent with neighbor 8.8.8.8
      Suppress hello for 0 neighbor(s)
    GigabitEthernet0/1 is up, line protocol is up
      Internet address is 10.10.10.1/24, Area 0
      Process ID 1, Router ID 5.5.5.5, Network Type BROADCAST, Cost:
    10
      Transmit Delay is 1 sec, State WAITING, Priority 1
```

No designated router on this network
      No backup designated router on this network
      Timer intervals configured, Hello 10, Dead 40, Wait 40,
   Retransmit 5
         No Hellos (Passive interface)
      Index 3/3, flood queue length 0
      Next 0x0(0)/0x0(0)
      Last flood scan length is 1, maximum is 1
      Last flood scan time is 0 msec, maximum is 0 msec
      Neighbor Count is 0, Adjacent neighbor count is 0
      Suppress hello for 0 neighbor(s)
   R2#
R3

   R3#show ip ospf interface

   Serial0/0/1 is up, line protocol is up
      Internet address is 172.31.23.2/30, Area 0
      Process ID 1, Router ID 8.8.8.8, Network Type POINT-TO-POINT,
   Cost: 9500
      Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
      No designated router on this network
      No backup designated router on this network
      Timer intervals configured, Hello 10, Dead 40, Wait 40,
   Retransmit 5
         Hello due in 00:00:00
      Index 1/1, flood queue length 0
      Next 0x0(0)/0x0(0)
      Last flood scan length is 1, maximum is 1
      Last flood scan time is 0 msec, maximum is 0 msec
      Neighbor Count is 1 , Adjacent neighbor count is 1
         Adjacent with neighbor 5.5.5.5
      Suppress hello for 0 neighbor(s)
   Loopback4 is up, line protocol is up
      Internet address is 192.168.4.1/24, Area 0
      Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost:
   0
      Loopback interface is treated as a stub Host
   Loopback5 is up, line protocol is up
      Internet address is 192.168.5.1/24, Area 0
      Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost:
   0
      Loopback interface is treated as a stub Host
   Loopback6 is up, line protocol is up
      Internet address is 192.168.6.1/24, Area 0

Process ID 1, Router ID 8.8.8.8, Network Type LOOPBACK, Cost:
    0
      Loopback interface is treated as a stub Host
    R3#

2.3 Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

R1

R1#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 1.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 area 0
    192.168.30.0 0.0.0.255 area 0
    192.168.40.0 0.0.0.255 area 0
    192.168.200.0 0.0.0.255 area 0
    192.168.99.0 0.0.0.255 area 0
  Passive Interface(s):
    Vlan1
    GigabitEthernet0/0
    GigabitEthernet0/1
    Serial0/0/0
    Serial0/0/1
  Routing Information Sources:
    Gateway   Distance   Last Update
    1.1.1.1   110   00:11:35
  Distance: (default is 110)

R2

R2#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 5.5.5.5
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:

```
    172.31.21.0 0.0.0.3 area 0
    172.31.23.0 0.0.0.3 area 0
    10.10.10.0 0.0.0.255 area 0
  Passive Interface(s):
    GigabitEthernet0/1
  Routing Information Sources:
    Gateway          Distance      Last Update
    5.5.5.5              110        00:00:51
    8.8.8.8              110        00:29:24
  Distance: (default is 110)
```

R3

R3#show ip protocols

```
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 8.8.8.8
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
    192.168.4.0 0.0.3.255 area 0
  Passive Interface(s):
    Loopback4
    Loopback5
    Loopback6
  Routing Information Sources:
    Gateway          Distance      Last Update
    5.5.5.5              110        00:01:30
    8.8.8.8              110        00:00:01
  Distance: (default is 110)
```

3. **Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.**

S1

```
S1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
```

```
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#vlan 99
S1(config-vlan)#name trunk
S1(config-vlan)#exit
S1(config)#interface vlan 99
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#interface fastEthernet 0/3
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#interface fastEthernet 0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#interface range fastEthernet 0/1-2, fastEthernet 0/4-
23, gigabitEthernet 0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#exit
S1(config)#interface fastEthernet 0/6
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#exit
S1(config)#interface range fastEthernet 0/1-2, fastEthernet 0/4,
gigabitEthernet 0/1-2, fastEthernet 0/7-24
S1(config-if-range)#shutdown
```

```
S1(config-if-range)#exit
S1(config)#


S3

S3>en
S3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S3(config)#vlan 30
S3(config-vlan)#name Administracion
S3(config-vlan)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 200
S3(config-vlan)#nam
S3(config-vlan)#name Mantenimiento
S3(config-vlan)#vlan 99
S3(config-vlan)#name trunk
S3(config-vlan)#exit
S3(config)#interface vlan 99
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan99, changed
state to up

S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exi
S3(config)#ip default-gateway 192.168.40.1
S3(config)#interface fastEthernet 0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#ex
S3(config)#interface range fastEthernet 0/1-2, fastEthernet 0/4-
24, gigabitEthernet 0/1-2
S3(config-if-range)#switchport mode access
S3(config-if-range)#shutdown
S3(config-if-range)#exit
S3(config)#interface fastEthernet 0/1
S3(config-if)#no shutdown

S3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up

S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#exit
S3(config)#
```

R1

```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface gigabitEthernet 0/0.30
R1(config-subif)#description AdmLAN
R1(config-subif)#encapsulation dot1Q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#ex
R1(config)#interface gigabitEthernet 0/0.40
R1(config-subif)#description MercadeoLAN
R1(config-subif)#encapsulation dot1Q 40
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
R1(config-subif)#ex
R1(config)#interface gigabitEthernet 0/0.200
R1(config-subif)#description MantenimientoLAN
R1(config-subif)#encapsulation dot1Q 200
R1(config-subif)#ip address 19.168.200.1 255.255.255.0
R1(config-subif)#ex
R1(config)#interface gigabitEthernet 0/0
R1(config-if)#no shutdown
R1(config-if)#
R1(config-if)#ex
R1(config)#ex
R1#
```

4. En el Switch 3 deshabilitar DNS lookup

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain-lookup
```

```
R1(config)#


Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R2
R2(config)#no ip domain-lookup
R2(config)#
R2#

Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#
```

5. Asignar direcciones IP a los Switches acorde a los lineamientos.
6. Desactivar todas las interfaces que no sean utilizadas en el esquema de
   red.
Desarrollado en el punto 3

7. Implement DHCP and NAT for IPv4
8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.
9. Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para
   configuraciones estáticas.

Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#ip dhcp pool ADMINISTRACION
R1(dhcp-config)#dns-server 10.10.10.11
```

```
R1(dhcp-config)#domain-name ccna-unad.com
                          ^
% Invalid input detected at '^' marker.

R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#exit
R1(config)#ip dhcp pool MERCADEO
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#
```

10. Configurar NAT en R2 para permitir que los host puedan salir a internet

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#interface gigabitEthernet 0/0
R2(config-if)#ip nat inside
R2(config-if)#exi
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.4.0 0.0.3.255
R2(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.229
netmask 255.255.255.248
R2(config)#
```

11. Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip acc
R2(config)#ip access-list s
R2(config)#ip access-list standard ADMIN-UNAD
R2(config-std-nacl)#per
R2(config-std-nacl)#permit h
R2(config-std-nacl)#permit host 172.31.21.1
R2(config-std-nacl)#exit
R2(config)#l
R2(config)#lin
R2(config)#line v
R2(config)#line vty 0 4
R2(config-line)#acc
R2(config-line)#acce
```

```
R2(config-line)#access-class ADMIN_UNAD i
R2(config-line)#access-class ADMIN_UNAD in
R2(config-line)#exit
R2(config)#
```

12. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

13. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

CONCLUSIONES

- Las herramientas de simulación permiten establecer escenarios LAN/WAN para realizar un análisis sobre el comportamiento de diversos protocolos y métricas de enrutamiento.

- El simulador Packet Tracer, destinado a la simulación de conexión de computadores en una red, permite conocer más a fondo las configuraciones de red que se realiza para una posterior aplicación.

- Las herramientas de simulación permiten observar comportamiento de enrutadores, mediante el uso de comandos de administración de tablas de enrutamiento, bajo el uso de protocolos.

- Para la configuración del protocolo de enrutamiento del OSPFv2 se debe crear el proceso de OSPF desde la configuración global con el comando "router ospf", después se deben configurar los rangos de red mediante "network área", todas las interfaces que se incluyan mediante ese comando estarán participando en esa área de OSPF

- Las NAT son el único mecanismo utilizado para intercomunicar redes de distintas clases, consiste en transportar la información mediante paquetes a través del router sin importar la clase de la misma.

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