

**DIPLOMADO DE PROFUNDIZACIÓN CISCO (DISEÑO E IMPLEMENTACIÓN
DE SOLUCIONES INTEGRADAS LAN / WAN).**

EVALUACIÓN - PRUEBA DE HABILIDADES PRACTICAS CCNA

GRUPO: 203092_22

**REALIZADO POR: BRANDON CAMILO HERRERA MEDINA
CÓDIGO: 1 113 676 914**

TUTORA: NANCY AMPARO GUACA

**UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA
INGENIERÍA DE SISTEMAS
CEAD – PALMIRA
DICIEMBRE – 2018**

TABLA DE CONTENIDO

Introducción	3
Desarrollo de los escenarios	4
Escenario 1	5
Escenario 2.....	25
Conclusiones	45
Referencias Bibliográficas	46

INTRODUCCIÓN

En el presente trabajo se realiza el análisis y el desarrollo de los distintos ejercicios planteados como fase final del diplomado de profundización cisco. La evaluación de prueba de habilidades prácticas cuenta con dos escenarios propuestos en los cuales se plantean distintas problemáticas relacionadas al ámbito práctico del diseño e implementación de redes.

En esta actividad se aplican los conocimientos obtenidos durante el desarrollo del curso y cada una de sus unidades y módulos. Veremos temáticas como la implementación de NAT, el servidor DHCP, RIPV2, el routing entre VLAN, configuración de direcciones IP, los enlaces troncales, protocolo de enrutamiento OSPFv2, entre otros.

DESARROLLO DE LOS ESCENARIOS

Escenario 1

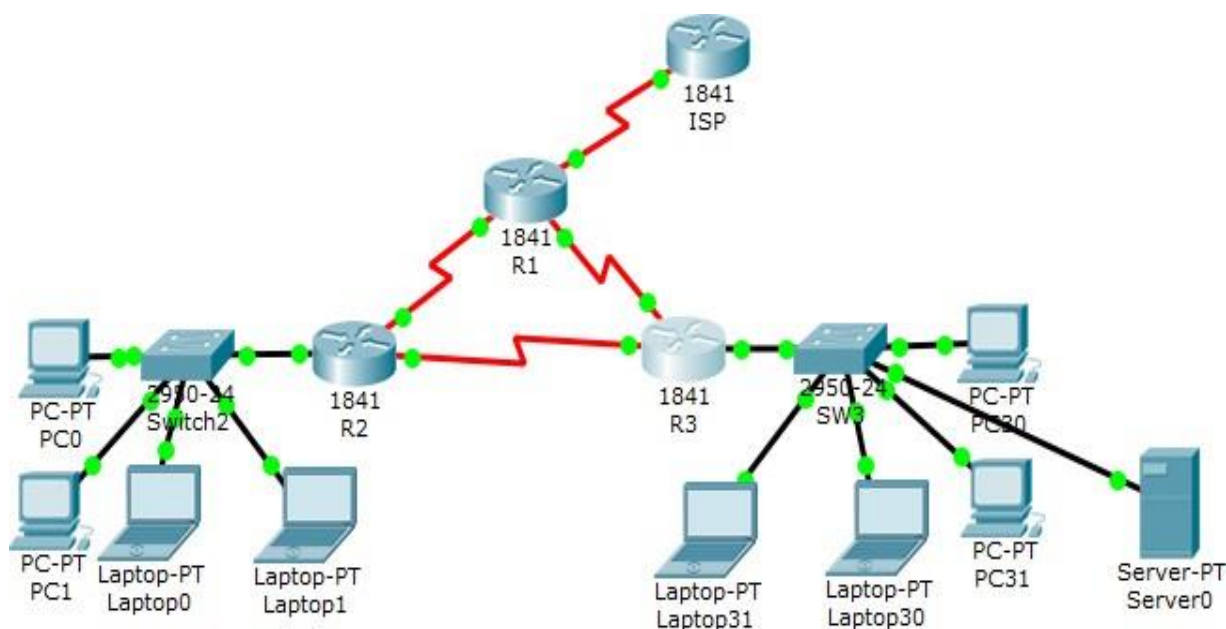


Tabla de direccionamiento

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.

Descripción de las actividades

- **SW1** VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1.

Asignamos las VLAN:

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

Las asignamos a las interfaces:

```
SW2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW2(config)#int range f0/2-3
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 100
SW2(config-if-range)#int range f0/4-5
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 200
SW2(config-if-range)#exit
SW2(config)#end
SW2#
%SYS-5-CONFIG_I: Configured from console by console
SW2#wr
```

Verificamos que estén asignados:

```
SW2#show vlan
```

```
VLAN Name Status Ports
```

```
-----
1 default active Fa0/1, 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
100 LAPTOPS active Fa0/2, Fa0/3
200 DESTOPS active Fa0/4, Fa0/5

Configuramos el SW3:

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW3
SW3(config)#vlan 1
SW3(config-vlan)#exit
SW3(config)#int range f0/1-24
SW3(config-if-range)#switchport mode access
SW3(config-if-range)#switchport access vlan 1
SW3(config-if-range)#exit
SW3(config)#end
SW3#
%SYS-5-CONFIG_I: Configured from console by console
```

```
SW3#wr
Building configuration...
[OK]
```

```
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
```

- Los puertos de red que no se utilizan se deben deshabilitar.

Se deshabilitan los puertos del 6 al 23 en el SW3:

```
SW3>en
SW3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW3(config)#int range f0/6-23
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 FastEthernet0/23, changed state to
administratively down

SW3(config-if-range)#exit
SW3(config)#end
SW3#
%SYS-5-CONFIG_I: Configured from console by console

SW3#wr
Building configuration...

[OK]
```

Se deshabilitan los puertos del 6 al 24 en el SW2:

```
SW2>en
SW2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW2(config)#int range f0/6-24
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 FastEthernet0/24, changed state to administratively down

```
SW2(config-if-range)#exit
SW2(config)#end
SW2#
%SYS-5-CONFIG_I: Configured from console by console
```

```
SW2#wr
Building configuration...
[OK]
```

Puerto troncal SW2:

```
SW2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW2(config)#int f0/1
SW2(config-if)#switchport mode trunk
```

Puerto troncal SW3:

```
SW3>en
SW3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
SW3(config)#int f0/1
SW3(config-if)#switchport mode trunk
SW3(config-if)#
```

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

Dirección IP R1:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 200.123.211.2 255.255.255.0
Router(config-if)#exit
Router(config)#int s0/1/0
Router(config-if)#ip address 10.0.0.1 255.255.255.252
Router(config-if)#exit
Router(config)#int s0/1/1
Router(config-if)#ip address 10.0.0.5 255.255.255.252
Router(config-if)#end
```

Dirección IP R2:

```
Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0.100
Router(config-subif)#encapsulation dot1Q 100
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/0.200
Router(config-subif)#encapsulation dot1Q 200
Router(config-subif)#ip address 192.168.21.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int s0/0/0
Router(config-if)#ip address 10.0.0.2 255.255.255.252
Router(config-if)#exit
Router(config)#int s0/0/1
Router(config-if)#ip address 10.0.0.9 255.255.255.252
Router(config-if)#exit
Router(config)#end
```

Dirección IP R3:

```
Router>en
```

```
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#ip address 192.168.30.1 255.255.255.0
Router(config-if)#exit
Router(config)#ipv6 unicast-routing
Router(config)#int s0/0/0
Router(config-if)#ip address 10.0.0.6 255.255.255.0
Router(config-if)#ip address 10.0.0.6 255.255.255.252
Router(config-if)#exit
Router(config)#int s0/0/1
Router(config-if)#ip address 10.0.0.10 255.255.255.252
Router(config-if)#exit
```

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

Se realiza a través del escritorio del pc en Packet Tracer, entramos en ip configuration y damos clic en DHCP.

- **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**.

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/1/1
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#int s0/1/0
Router(config-if)#ip nat inside
Router(config-if)#exit
Router(config)#int s0/0/0
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128 netmask
255.255.255.0
Router(config)#access-list 1 permit 192.168.0.0 0.0.255.255
Router(config)#access-list 1 permit 10.0.0.0 0.255.255.255
Router(config)#ip nat inside source list 1 interface s0/0/0 overload
Router(config)#ip nat inside source static tcp 192.168.30.6 80 200.123.211.1 80
```

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

```
Router(config)#hostname R1
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 10.0.0.0
R1(config-router)#exit
R1(config)#end
```

Verificamos los procedimientos:

```
Pro Inside global Inside local Outside local Outside global
tcp 200.123.211.1:80 192.168.30.6:80 --- ---
```

```
R1#show ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 1 extended)
Outside Interfaces: Serial0/0/0
Inside Interfaces: Serial0/1/0 , Serial0/1/1
Hits: 0 Misses: 0
Expired translations: 0
Dynamic mappings:
R1#
```

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

```
R2>en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9
R2(config)#ip dhcp pool INSIDE-DEVS
R2(dhcp-config)#network 192.168.20.1 255.255.255.0
R2(dhcp-config)#network 192.168.21.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 0.0.0.0
R2(dhcp-config)#exit
R2(config)#int vlan 100
```

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

```
R2(config)#int vlan 100
R2(config-if)#ip address 192.168.20.1 255.255.255.0
% 192.168.20.0 overlaps with FastEthernet0/0.100
R2(config-if)#exit
R2(config)#int vlan 200
R2(config-if)#ip address 192.168.21.1 255.255.255.0
% 192.168.21.0 overlaps with FastEthernet0/0.200
R2(config-if)#end
```

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

The top part of the image shows a network diagram with a central switch labeled '2950-24 SV3'. It is connected to four devices: 'Laptop-PT Laptop30', 'PC-PT PC31', 'PC-PT PC30', and 'Server-PT Server0'. Below the diagram is a 'Realtime' traffic capture window. It contains a table with the following data:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num
●	Successful	PC31	Server0	ICMP	Blue	0.000	N	0
●	Successful	PC30	Server0	ICMP	Light Blue	0.000	N	1
●	Successful	Laptop...	Server0	ICMP	Cyan	0.000	N	2

The bottom part of the image shows a screenshot of the 'Command Prompt' window on PC31. The text in the window is as follows:

```

Packet Tracer PC Command Line 1.0
PC>ping 169.254.134.135

Pinging 169.254.134.135 with 32 bytes of data:

Reply from 169.254.134.135: bytes=32 time=3ms TTL=128
Reply from 169.254.134.135: bytes=32 time=0ms TTL=128
Reply from 169.254.134.135: bytes=32 time=0ms TTL=128
Reply from 169.254.134.135: bytes=32 time=0ms TTL=128

Ping statistics for 169.254.134.135:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 0ms

PC>

```

- 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.

Se realiza a través del escritorio del pc en Packet Tracer, entramos en ip configuration y damos clic en DHCP y también damos clic en DHCP en la configuración de IPv6.

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

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#ipv6 unicast-routing
R3(config)#int f0/0
R3(config-if)#ipv6 enable
R3(config-if)#ip address 192.168.30.1 255.255.255.0
R3(config-if)#ipv6 address 2001:db8::9C0:80F:301/64
R3(config-if)#no shutdown
```

- R1, R2 y R3 intercambian información de routing mediante RIP versión 2.

```
R1>en
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)#network 10.0.0.4
R1(config-router)#end
```

```
R2>en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#network 10.0.0.0
```

```
R2(config-router)#network 10.0.0.8
R2(config-router)#end
```

```
R3(config)#router rip
R3(config-router)#version 2
R3(config-router)#network 10.0.0.0
R3(config-router)#network 10.0.0.8
R3(config-router)#end
```

- R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1.

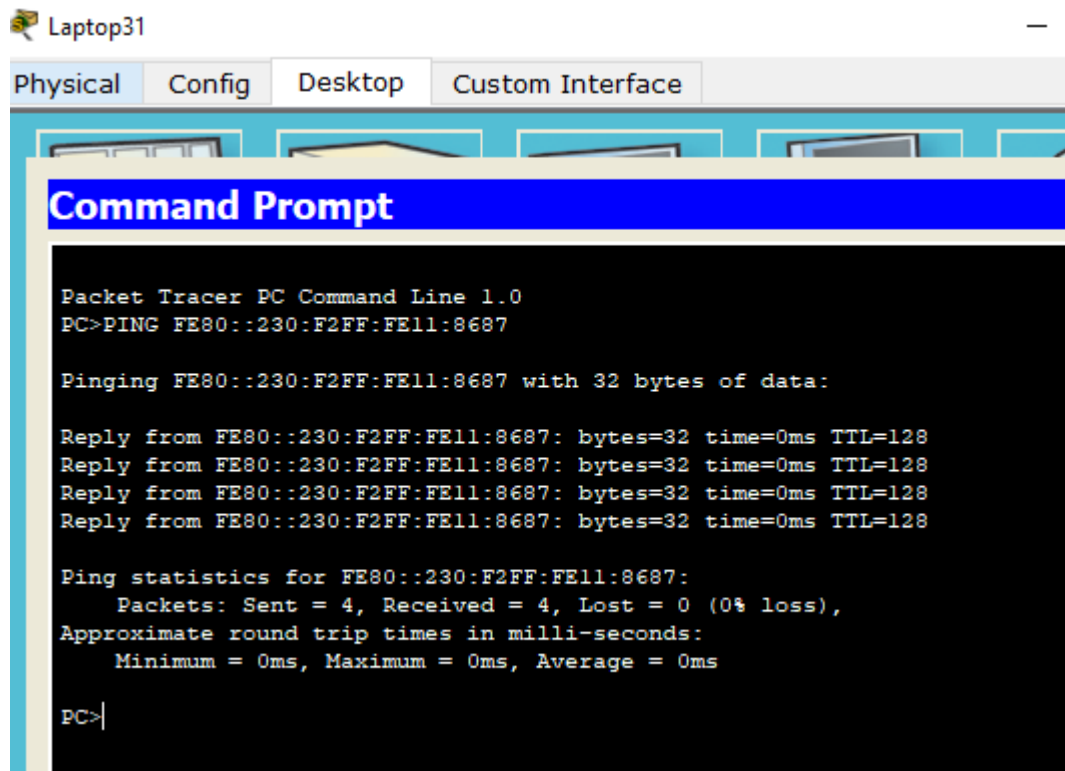
```
R2(config)#router rip
R2(config-router)#network 200.123.211.0
```

```
R1(config)#router rip
R1(config-router)#network 200.123.211.0
```

```
R3(config)#router rip
R3(config-router)#network 200.123.211.0
```


- 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.

Ping al servidor desde los diferentes equipos:



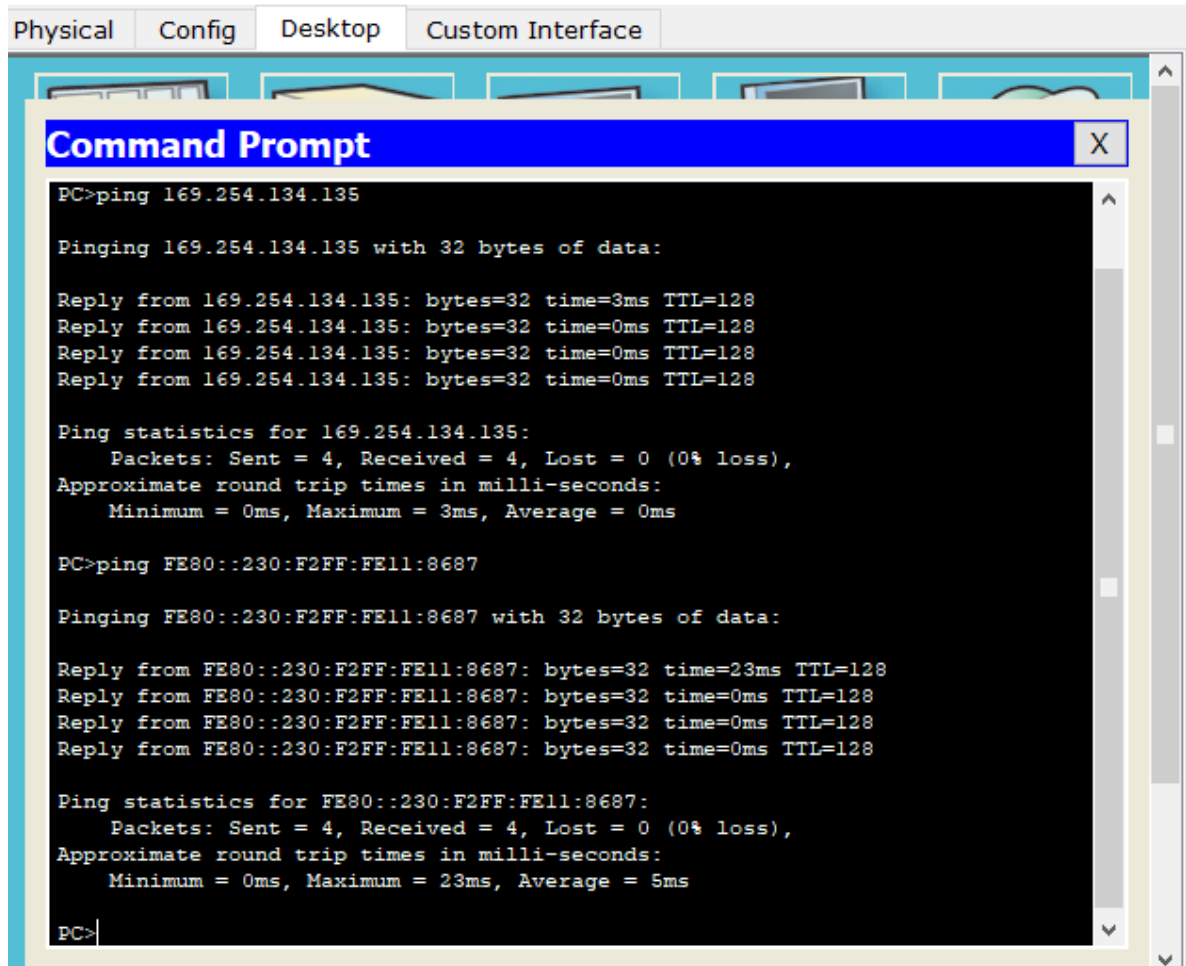
```
Laptop31
Physical Config Desktop Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>PING FE80::230:F2FF:FE11:8687

Pinging FE80::230:F2FF:FE11:8687 with 32 bytes of data:

Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE11:8687:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```



The screenshot shows a PC31 desktop environment with a window titled "Command Prompt". The window has a blue title bar and a close button (X). The desktop background is light blue with several icons. The Command Prompt window has a black background and white text. The text shows two ping commands being executed. The first command is "ping 169.254.134.135" and the second is "ping FE80::230:F2FF:FE11:8687". Both commands show successful results with 4 packets sent and received, 0% loss, and various round trip times.

```
PC>ping 169.254.134.135

Pinging 169.254.134.135 with 32 bytes of data:

Reply from 169.254.134.135: bytes=32 time=3ms TTL=128
Reply from 169.254.134.135: bytes=32 time=0ms TTL=128
Reply from 169.254.134.135: bytes=32 time=0ms TTL=128
Reply from 169.254.134.135: bytes=32 time=0ms TTL=128

Ping statistics for 169.254.134.135:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 0ms

PC>ping FE80::230:F2FF:FE11:8687

Pinging FE80::230:F2FF:FE11:8687 with 32 bytes of data:

Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=23ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE11:8687:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 23ms, Average = 5ms

PC>
```

Laptop30

```
Physical Config Desktop Custom Interface

Command Prompt

Packet Tracer PC Command Line 1.0
PC>ping FE80::230:F2FF:FE11:8687

Pinging FE80::230:F2FF:FE11:8687 with 32 bytes of data:

Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=1ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE11:8687:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PC30

```
Physical Config Desktop Custom Interface

Command Prompt

Packet Tracer PC Command Line 1.0
PC>ping FE80::230:F2FF:FE11:8687

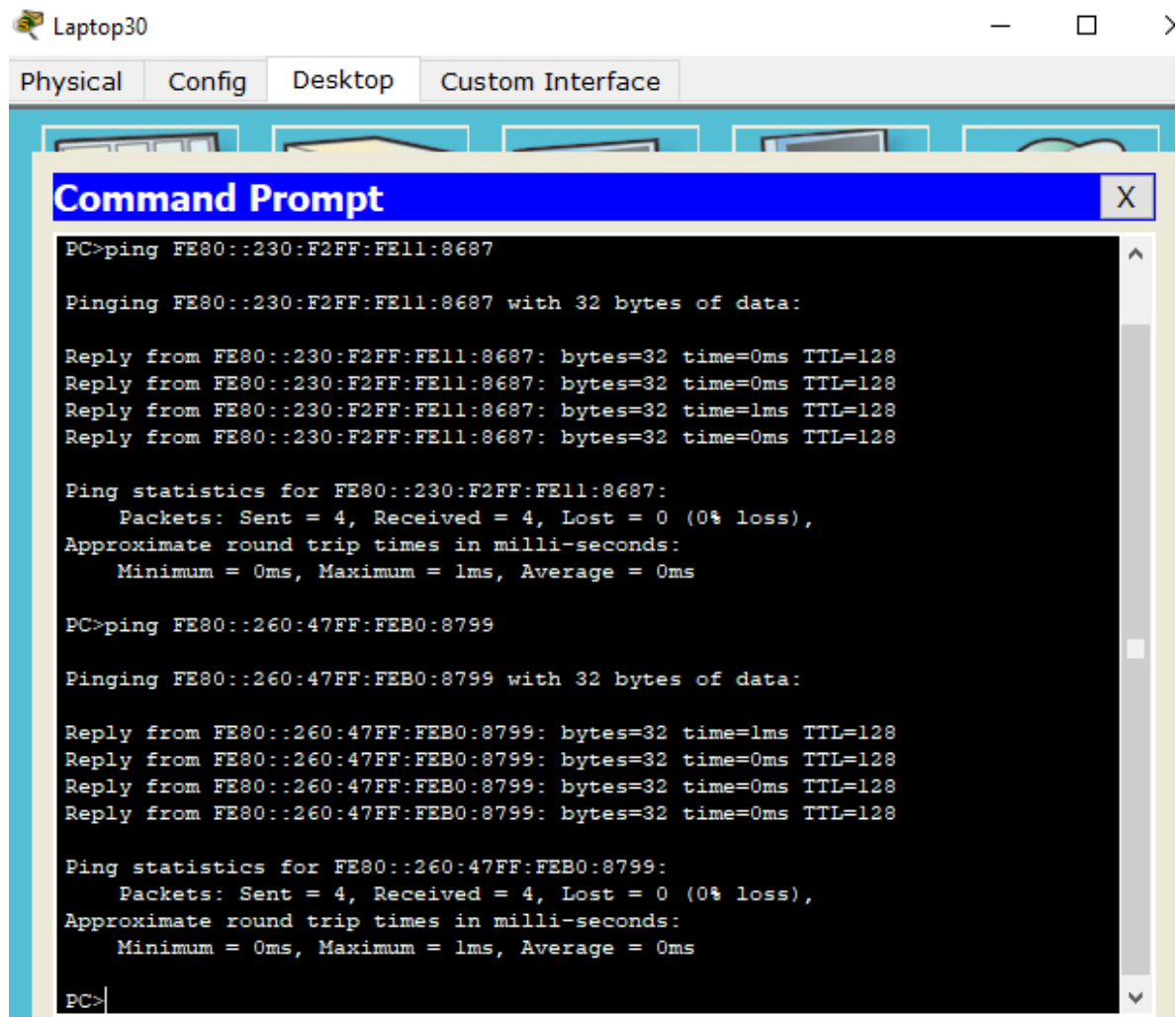
Pinging FE80::230:F2FF:FE11:8687 with 32 bytes of data:

Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE11:8687:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping desde los diferentes equipos:

Laptop 30 a Laptop 31:



The screenshot shows a virtual desktop environment with a window titled "Laptop30". The window has tabs for "Physical", "Config", "Desktop", and "Custom Interface". A "Command Prompt" window is open, displaying the following text:

```
PC>ping FE80::230:F2FF:FE11:8687

Pinging FE80::230:F2FF:FE11:8687 with 32 bytes of data:

Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=1ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE11:8687:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>ping FE80::260:47FF:FEB0:8799

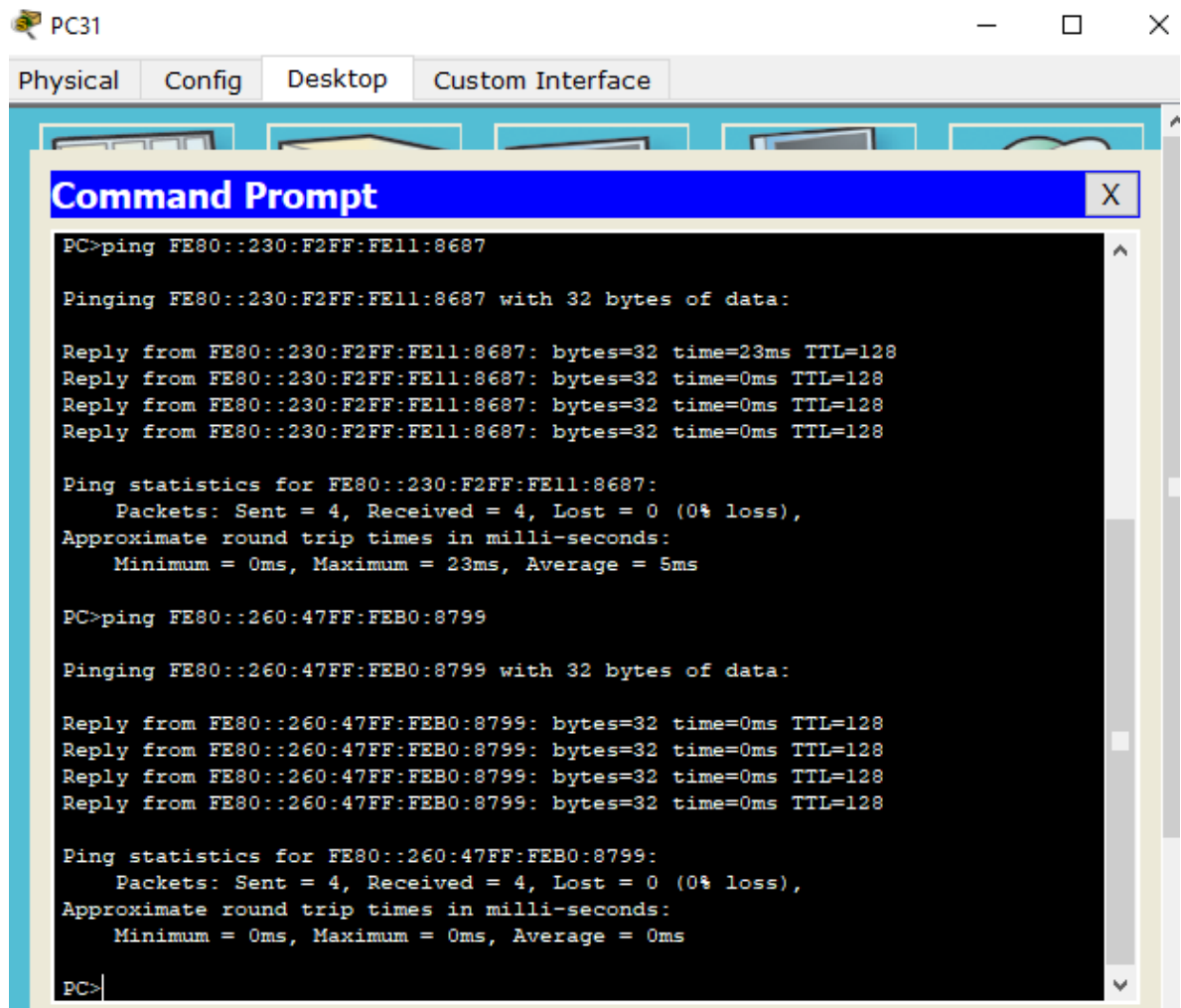
Pinging FE80::260:47FF:FEB0:8799 with 32 bytes of data:

Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=1ms TTL=128
Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128
Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128
Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128

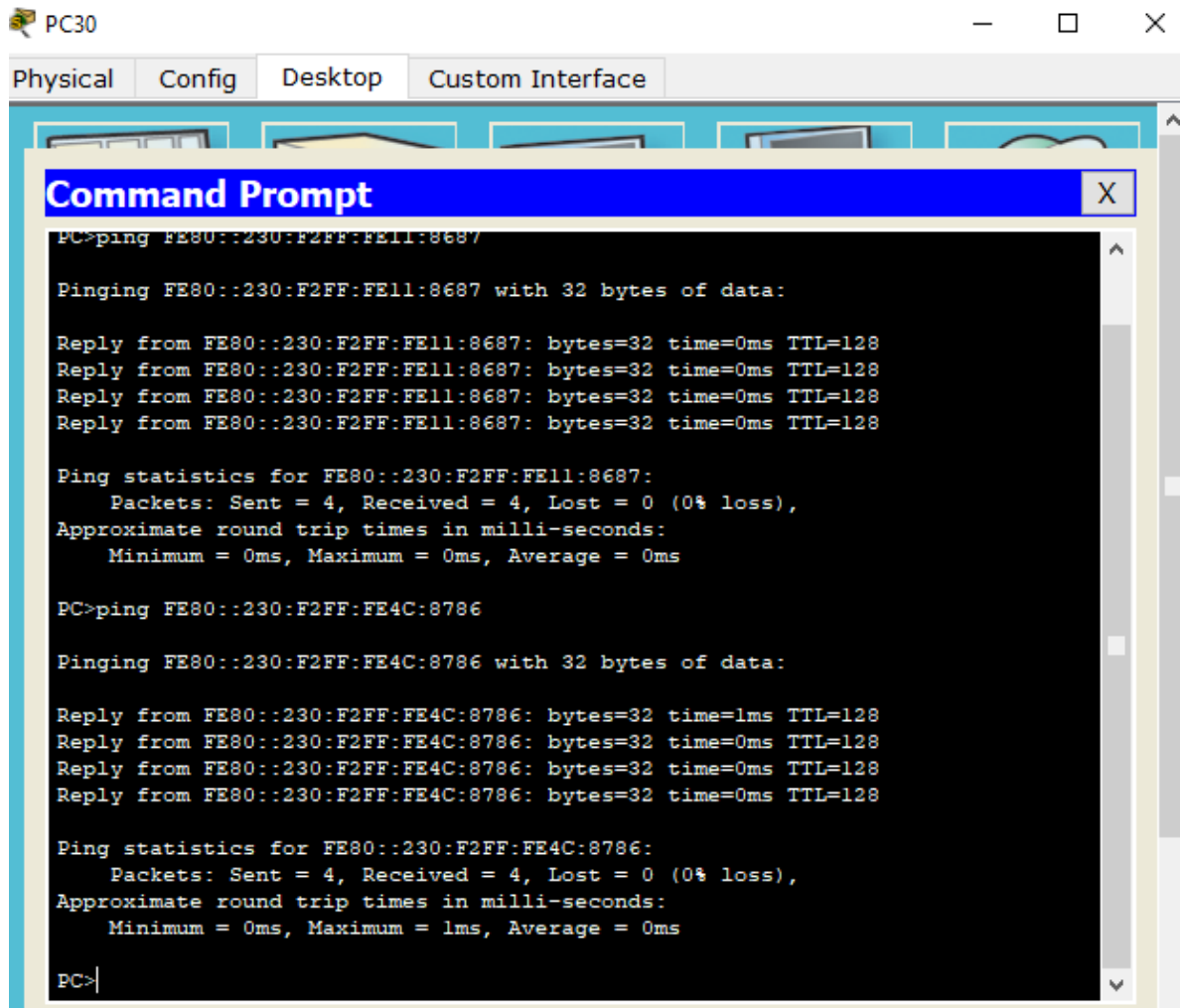
Ping statistics for FE80::260:47FF:FEB0:8799:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PC31 a Laptop 31:



PC30 a Laptop 31:



The image shows a screenshot of a virtual machine window titled "PC30". The window has tabs for "Physical", "Config", "Desktop", and "Custom Interface". The "Desktop" tab is active, showing a virtual desktop environment. A "Command Prompt" window is open in the foreground, displaying the results of two ping commands. The first command is for the IP address FE80::230:F2FF:FE11:8687, and the second is for FE80::230:F2FF:FE4C:8786. Both commands show successful replies with 0ms round trip times and 128 TTL.

```
PC>ping FE80::230:F2FF:FE11:8687

Pinging FE80::230:F2FF:FE11:8687 with 32 bytes of data:

Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE11:8687: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE11:8687:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping FE80::230:F2FF:FE4C:8786

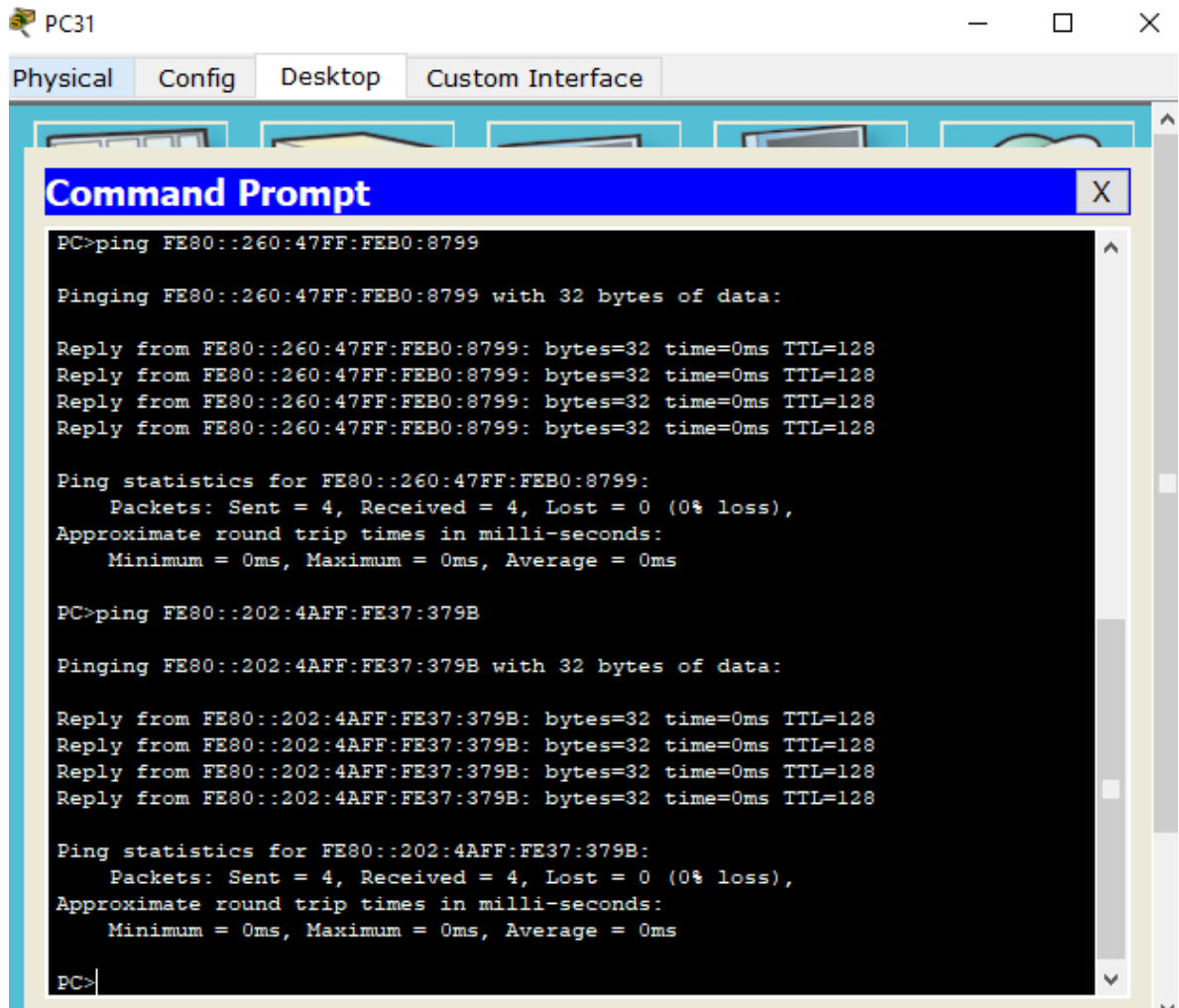
Pinging FE80::230:F2FF:FE4C:8786 with 32 bytes of data:

Reply from FE80::230:F2FF:FE4C:8786: bytes=32 time=1ms TTL=128
Reply from FE80::230:F2FF:FE4C:8786: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE4C:8786: bytes=32 time=0ms TTL=128
Reply from FE80::230:F2FF:FE4C:8786: bytes=32 time=0ms TTL=128

Ping statistics for FE80::230:F2FF:FE4C:8786:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PC31 a PC30:



The screenshot shows a desktop environment for PC31 with tabs for Physical, Config, Desktop, and Custom Interface. A Command Prompt window is open, displaying the following text:

```
PC>ping FE80::260:47FF:FEB0:8799

Pinging FE80::260:47FF:FEB0:8799 with 32 bytes of data:

Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128
Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128
Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128
Reply from FE80::260:47FF:FEB0:8799: bytes=32 time=0ms TTL=128

Ping statistics for FE80::260:47FF:FEB0:8799:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping FE80::202:4AFF:FE37:379B

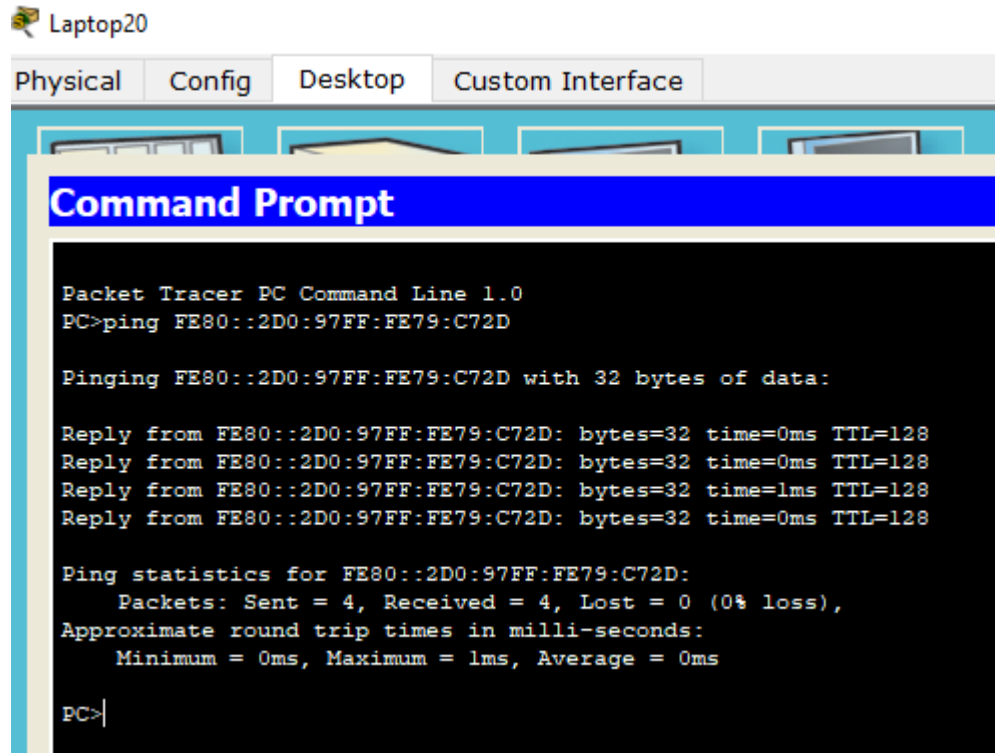
Pinging FE80::202:4AFF:FE37:379B with 32 bytes of data:

Reply from FE80::202:4AFF:FE37:379B: bytes=32 time=0ms TTL=128
Reply from FE80::202:4AFF:FE37:379B: bytes=32 time=0ms TTL=128
Reply from FE80::202:4AFF:FE37:379B: bytes=32 time=0ms TTL=128
Reply from FE80::202:4AFF:FE37:379B: bytes=32 time=0ms TTL=128

Ping statistics for FE80::202:4AFF:FE37:379B:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```

Laptop 20 a Laptop 21:



The screenshot shows a Packet Tracer interface for Laptop 20. The 'Command Prompt' window is open, displaying the following text:

```
Packet Tracer PC Command Line 1.0
PC>ping FE80::2D0:97FF:FE79:C72D

Pinging FE80::2D0:97FF:FE79:C72D with 32 bytes of data:

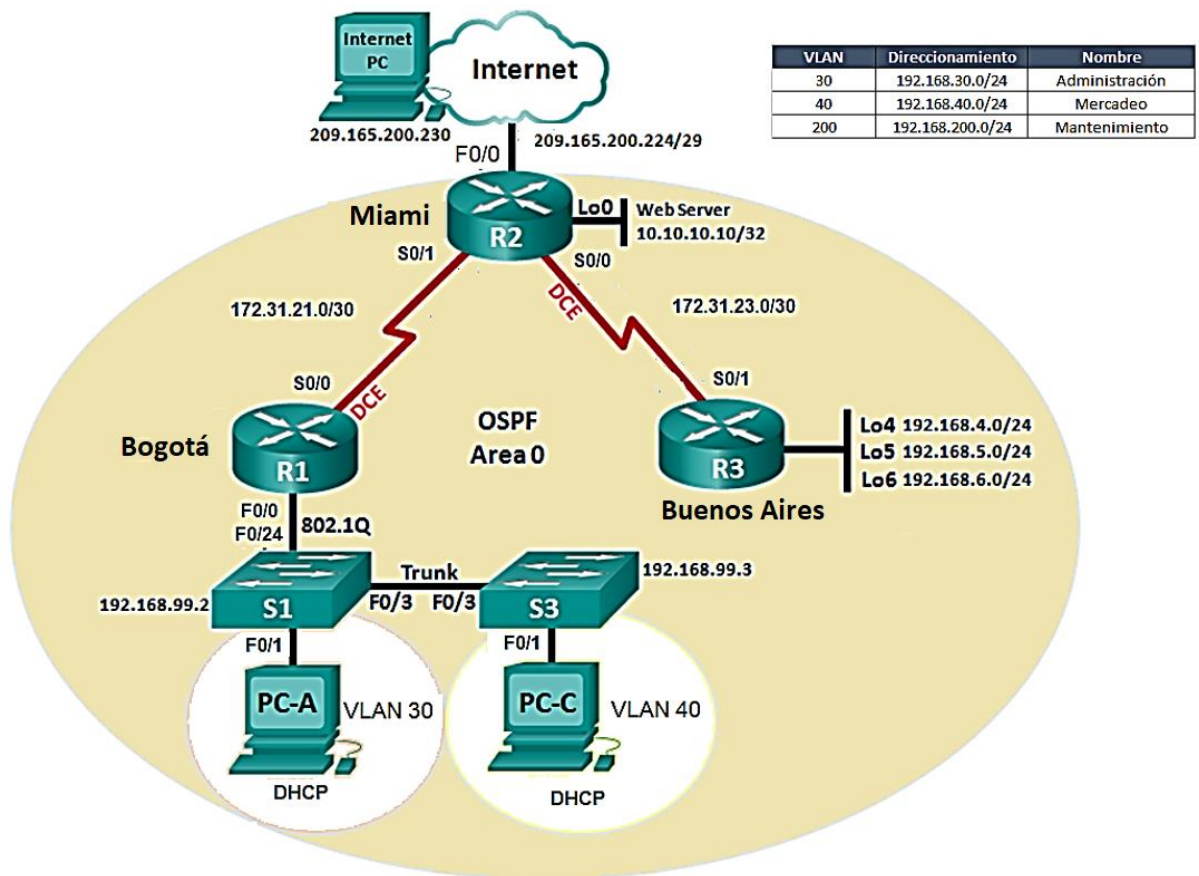
Reply from FE80::2D0:97FF:FE79:C72D: bytes=32 time=0ms TTL=128
Reply from FE80::2D0:97FF:FE79:C72D: bytes=32 time=0ms TTL=128
Reply from FE80::2D0:97FF:FE79:C72D: bytes=32 time=1ms TTL=128
Reply from FE80::2D0:97FF:FE79:C72D: bytes=32 time=0ms TTL=128

Ping statistics for FE80::2D0:97FF:FE79:C72D:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```


Escenario 2

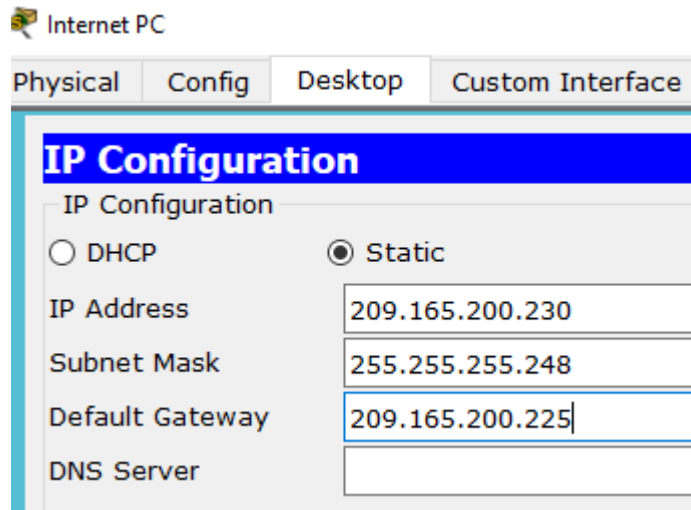
Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Miami, Bogotá y Buenos Aires, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con los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



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

Las configuraciones de los pc's (Internet PC, PC-A, PC-C) se realiza por medio del escritorio en la opción IP configuración.

Como se realiza en el siguiente ejemplo:



R1:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Bogota
Bogota(config)#int s0/0/0
Bogota(config-if)#ip address 192.168.99.2 255.255.255.0
```

```
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#no ip domain-lookup
Bogota(config)#int s0/0/0
Bogota(config-if)#description connection to R2
Bogota(config-if)#ip address 172.31.21.0 255.255.255.252
Bad mask /30 for address 172.31.21.0
Bogota(config-if)#clock rate 128000
This command applies only to DCE interfaces
Bogota(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Bogota(config-if)#
```

R2:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial0/0/0
Router(config-if)#ip address 172.31.21.1 255.255.255.252
Router(config-if)#exit
```

```
Router(config)#hostname Miami
Miami(config)#
Miami(config)#no ip domain-lookup
Miami(config)#int s0/0/0
Miami(config-if)#description connection to R1
Miami(config-if)#ip address 172.31.21.1 255.255.255.252
Miami(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
Miami(config-if)#int s0/0/1
Miami(config-if)#description connection to R3
Miami(config-if)#ip address 172.31.23.1 255.255.255.252
Miami(config-if)#clock rate 128000
Miami(config-if)#no shut

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

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

Miami(config)#int f0/0
Miami(config-if)#description connection to ISP
Miami(config-if)#ip address 209.165.200.225 255.255.255.248
Miami(config-if)#no shut

Miami(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

Miami(config-if)#int f0/1
Miami(config-if)#ip address 10.10.10.1 255.255.255.0
Miami(config-if)#no shut

Miami(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

Miami(config-if)#description connection Web Server
Miami(config-if)#exit
Miami(config)#ip route 0.0.0.0 0.0.0.0 f0/0
Miami(config)#
```

R3:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/1
Router(config-if)#ip address 172.31.23.2 255.255.255.252
Router(config-if)#exit
Router(config)#hostname BuenosAires
BuenosAires(config)#
```

```
BuenosAires>en
BuenosAires#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BuenosAires(config)#no ip domain-lookup
BuenosAires(config)#int s0/0/1
BuenosAires(config-if)#description connection to R2
BuenosAires(config-if)#ip address 172.31.23.2 255.255.255.252
BuenosAires(config-if)#no shut
```

```
BuenosAires(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
```

```
BuenosAires(config-if)#int lo4
```

```
BuenosAires(config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state
to up
```

```
BuenosAires(config-if)#ip address 192.168.4.1 255.255.255.0
BuenosAires(config-if)#no shutdown
BuenosAires(config-if)#int lo5
```

```
BuenosAires(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up
```

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

```
BuenosAires(config-if)#no shutdown
```

```
BuenosAires(config-if)#ip address 192.168.5.1 255.255.255.0
BuenosAires(config-if)#no shut
BuenosAires(config-if)#int lo6
```

```
BuenosAires(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
```

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

```
BuenosAires(config-if)#ip address 192.168.6.1 255.255.255.0
BuenosAires(config-if)#
```

S1:

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#no ip domain-lookup
Switch(config)#hostname S1
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)#exit
S1(config)#int vlan 30
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up
```

```
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int f0/3
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 Vlan30, changed state to up

```
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config)#int range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#
```

S3:

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#no ip domain-lookup
Switch(config)#hostname S3
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)#name Mantenimiento
S3(config-vlan)#exit
S3(config)#vlan 200
S3(config-vlan)#int vlan 200
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
```

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to up

```
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shut
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#int fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#
```

R1:

```
Bogota>en
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#int g0/1.30
%Invalid interface type and number
Bogota(config)#int f0/1.30
Bogota(config-subif)#description accounting LAN
Bogota(config-subif)#encapsulation dot1q 30
Bogota(config-subif)#ip address 192.168.30.1 255.255.255.0
Bogota(config-subif)#int f0/1.40
Bogota(config-subif)#description Mercadeo LAN
Bogota(config-subif)#encapsulation dot1q 40
Bogota(config-subif)#ip address 192.168.40.1 255.255.255.0
Bogota(config-subif)#int f0/1.200
Bogota(config-subif)#description Mantenimiento LAN
Bogota(config-subif)#encapsulation dot1q 200
Bogota(config-subif)#ip address 92.168.200.1 255.255.255.0
Bogota(config-subif)#int f0/1
Bogota(config-if)#no shut

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

%LINK-5-CHANGED: Interface FastEthernet0/1.30, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/1.40, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/1.200, changed state to up
```

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

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

R1:

```
Bogota>en
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#router ospf 1
Bogota(config-router)#router-id 1.1.1.1
Bogota(config-router)#network 172.31.21.0 0.0.0.3 area 0
Bogota(config-router)#network 192.168.30.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.40.0 0.0.0.255 area 0
Bogota(config-router)#network 192.168.200.0 0.0.0.255 area 0
Bogota(config-router)#passive-interface f0/1.30
Bogota(config-router)#passive-interface f0/1.40
Bogota(config-router)#passive-interface f0/1.200
Bogota(config-router)#exit
Bogota(config)#int s0/0/0
Bogota(config-if)#exit
Bogota(config)#int s0/0/0
Bogota(config-if)#bandwidth 128
Bogota(config-if)#bandwidth 256
Bogota(config-if)#ip ospf cost 9500
Bogota(config-if)#
```

R2:


```
Miami>en
Miami#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Miami(config)#router ospf 1
Miami(config-router)#router-id 5.5.5.5
Miami(config-router)#network 172.31.21.0 0.0.0.3 area 0
Miami(config-router)#network 172.31.23.0 0.0.0.3 area 0
Miami(config-router)#network 172.31.23.0 0.0.0.3 area 0
Miami(config-router)#network 10.10.10.0 0.0.0.255 area 0
Miami(config-router)#passive-interface f0/1
Miami(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all routers.
Miami(config-router)#int s0/0/0
Miami(config-if)#bandwidth 256
Miami(config-if)#int s0/0/1
Miami(config-if)#bandwidth 256
Miami(config-if)#int s0/0/0
Miami(config-if)#ip ospf cost 9500
Miami(config-if)#
```

R3:

```
BuenosAires>
BuenosAires>en
BuenosAires#conf t
Enter configuration commands, one per line. End with CNTL/Z.
BuenosAires(config)#router ospf 1
BuenosAires(config-router)#router-id 8.8.8.8
BuenosAires(config-router)#network 172.31.23.0 0.0.0.3 area 0
BuenosAires(config-router)#network 192.168.4.0 0.0.3.255 area 0
BuenosAires(config-router)#passive-interface lo4
BuenosAires(config-router)#passive-interface lo5
BuenosAires(config-router)#passive-interface lo6
BuenosAires(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all routers.
BuenosAires(config-router)#exit
BuenosAires(config)#int s0/0/1
BuenosAires(config-if)#bandwidth 256
BuenosAires(config-if)#int s0/0/1
BuenosAires(config-if)#ip ospf cost 9500
```

BuenosAires(config-if)#

Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2
- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface

Miami>en

Miami#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 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 00:00:08
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)
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.23.1/30, 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 00:00:00
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
Suppress hello for 0 neighbor(s)
FastEthernet0/1 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)

```
Miami>en
Miami#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 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 00:00:08
  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)
Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.23.1/30, 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 00:00:00
  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
  Suppress hello for 0 neighbor(s)
```

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

Miami#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):
FastEthernet0/1
Routing Information Sources:
Gateway Distance Last Update
5.5.5.5 110 00:22:43
Distance: (default is 110)

```
Miami#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):  
    FastEthernet0/1  
  Routing Information Sources:  
    Gateway        Distance      Last Update  
    5.5.5.5         110          00:22:43  
  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>en
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)#exit
S1(config)#int vlan 30
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#exit
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#
```

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)#name Mantenimiento
S3(config-vlan)#exit
S3(config)#vlan 200
S3(config-vlan)#int vlan 200
S3(config-if)#exit
S3(config)#int fa0/3
S3(config-if)#switchport mode trunk
```

```
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#int range fa0/1-2, fa0/4-24
```

4. En el Switch 3 deshabilitar DNS lookup

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

5. Asignar direcciones IP a los Switches acorde a los lineamientos.

S1:

```
S1>en
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Docentes
S1(config-vlan)#exit
S1(config)#vlan 40
S1(config-vlan)#exit
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)#exit
S1(config)#int vlan 30
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
```

S3:

```
S3>en
S3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#vlan 200
S3(config-vlan)#int vlan 200
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shut
```

```
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
```

6. Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

S1:

```
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#
```

S3:

```
S3(config)#int fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config)#int fa0/1
S3(config-if)#switchport acces vlan 40
S3(config-if)#int range fa0/1-2, fa0/4-24
S3(config-if-range)#
```

7. Implement DHCP and NAT for IPv4

```
BuenosAires(config-if)#int lo4
```

```
BuenosAires(config-if)#
```

```
%LINK-5-CHANGED: Interface Loopback4, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up
```

```
BuenosAires(config-if)#ip address 192.168.4.1 255.255.255.0
```

```
BuenosAires(config-if)#no shutdown
```

```
BuenosAires(config-if)#int lo5
```

```
BuenosAires(config-if)#
```

```
%LINK-5-CHANGED: Interface Loopback5, changed state to up
```

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

```
BuenosAires(config-if)#no shutdown
BuenosAires(config-if)#ip address 192.168.5.1 255.255.255.0
BuenosAires(config-if)#no shut
BuenosAires(config-if)#int lo6
```

```
BuenosAires(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
```

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

```
BuenosAires(config-if)#ip address 192.168.6.1 255.255.255.0
BuenosAires(config-if)#
```

8. Configurar R1 como servidor DHCP para las VLANs 30 y 40.

```
Bogota>en
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Bogota(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Bogota(config)#
```

9. Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.

```
Bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Bogota(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
```

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.

ADMINISTRACIÓN:


```

Bogota>en
Bogota#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Bogota(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
Bogota(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
Bogota(config)#ip dhcp pool ADMINISTRACION
Bogota(dhcp-config)#?
default-router Default routers
dns-server Set name server
exit Exit from DHCP pool configuration mode
network Network number and mask
no Negate a command or set its defaults
option Raw DHCP options
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#domain-name ccna-unad.com
^
% Invalid input detected at '^' marker.
Bogota(dhcp-config)#default-router 192.168.30.1
Bogota(dhcp-config)#network 192.168.30.0 255.255.255.0
Bogota(dhcp-config)#

```

MERCADEO:

```

Bogota(dhcp-config)#ip dhcp pool MERCADEO
Bogota(dhcp-config)#dns-server 10.10.10.11
Bogota(dhcp-config)#domain-name ccna-unad.com
^
% Invalid input detected at '^' marker.
Bogota(dhcp-config)#default-router 192.168.40.1
Bogota(dhcp-config)#network 192.168.40.0 255.255.255.0

```

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

```

Miami>en
Miami#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Miami(config)#ip nat inside source static 10.10.10.10 209.165.200.224
Miami(config)#int f0/0
Miami(config-if)#ip nat out
Miami(config-if)#ip nat outside
Miami(config-if)#int f0/1
Miami(config-if)#ip nat inside
Miami(config-if)#ip nat inside source static 10.10.10.10 209.165.200.229
Miami(config)#int f0/0

```

```
Miami(config-if)#ip nat outside
Miami(config-if)#int f0/1
Miami(config-if)#ip nat inside
Miami(config-if)#
```

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.

```
Miami#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Miami(config)#access-list 1 permit 192.168.30.0 0.0.0.255
Miami(config)#access-list 1 permit 192.168.40.0 0.0.0.255
Miami(config)#access-list 1 permit 192.168.4.0 0.0.3.255
```

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.

```
Miami(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask
255.255.255.248
Miami(config)#ip nat inside source list 1 pool INTERNET
```

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

```
PC>ipconfig

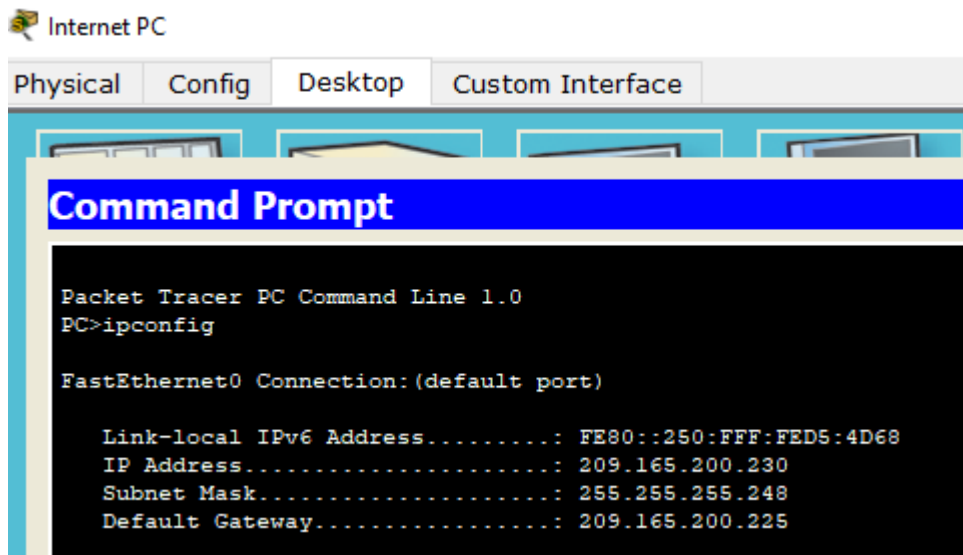
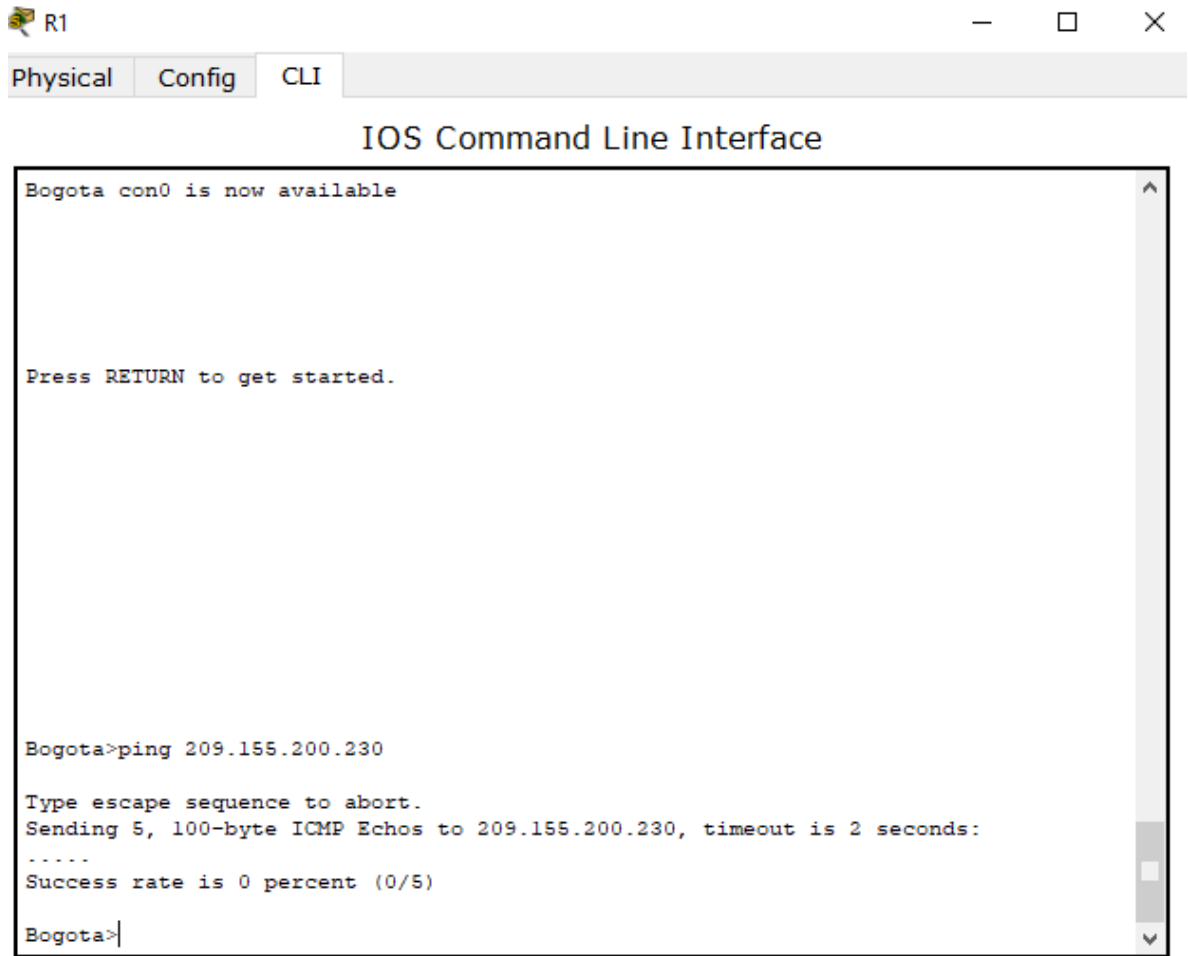
FastEthernet0 Connection:(default port)

    Link-local IPv6 Address . . . . . : FE80::201:42FF:FED2:E0A7
    Autoconfiguration IP Address. . . . : 169.254.224.167
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . : 0.0.0.0
```

```
Packet Tracer PC Command Line 1.0
PC>ipconfig

FastEthernet0 Connection:(default port)

    Link-local IPv6 Address . . . . . : FE80::290:2BFF:FE56:C52
    Autoconfiguration IP Address. . . . : 169.254.12.82
    Subnet Mask . . . . . : 255.255.0.0
    Default Gateway . . . . . : 0.0.0.0
```



IOS Command Line Interface

```
BuenosAires>ping 192.168.40.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

BuenosAires>ping 192.168.30.31

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.31, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

BuenosAires>ping 192.168.40.31

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.40.31, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5)

BuenosAires>
```

CONCLUSIONES

- Gracias al desarrollo de esta actividad logramos aplicar los conocimientos adquiridos durante el desarrollo del diplomado, logrando entender el funcionamiento de las redes, así mismo se aplican los conocimientos en diferentes escenarios que están basados en un aspecto práctico que puede ser encontrado en el ámbito laboral y profesional.
- En esta actividad pudimos desarrollar la implementación de NAT, también del servidor DHCP, RIPv2, y el routing entre VLAN, además se realiza la configuración de direcciones IP, los enlaces troncales, y subinterfaces. Además de realizar la topología de las redes de los dos escenarios desde cero, con la configuración completa de los equipos y sus conexiones.

REFERENCIAS BIBLIOGRÁFICAS

- CISCO. (2014). *DHCP. Principios de Enrutamiento y Conmutación*. Obtenido de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module10/index.html#10.0.1.1>
- CISCO. (2014). *Enrutamiento entre VLANs. Principios de Enrutamiento y Conmutación*. Obtenido 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*. Obtenido de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module6/index.html#6.0.1.1>
- CISCO. (2014). *Listas de control de acceso. Principios de Enrutamiento y Conmutación*. Obtenido de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module9/index.html#9.0.1.1>
- CISCO. (2014). *OSPF de una sola área. Principios de Enrutamiento y Conmutación*. Obtenido de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module8/index.html#8.0.1.1>
- CISCO. (2014). *VLANs. Principios de Enrutamiento y Conmutación*. Obtenido de <https://static-course-assets.s3.amazonaws.com/RSE50ES/module3/index.html#3.0.1.1>
- UNAD. (2014). *Configuración de Switches y Routers [OVA]*. Obtenido de <https://1drv.ms/u/s!AmIJYei-NT1IhgL9QChD1m9EuGqC>