EVALUACIÓN – PRUEBA DE HABILIDADES PRÁCTICAS CCNA

PRESENTADO POR:

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GRUPO:

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UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA (UNAD)

ESCUELA DE CIENCIAS BÁSICAS, TECNOLOGÍA E INGENIERÍA - ECBTI

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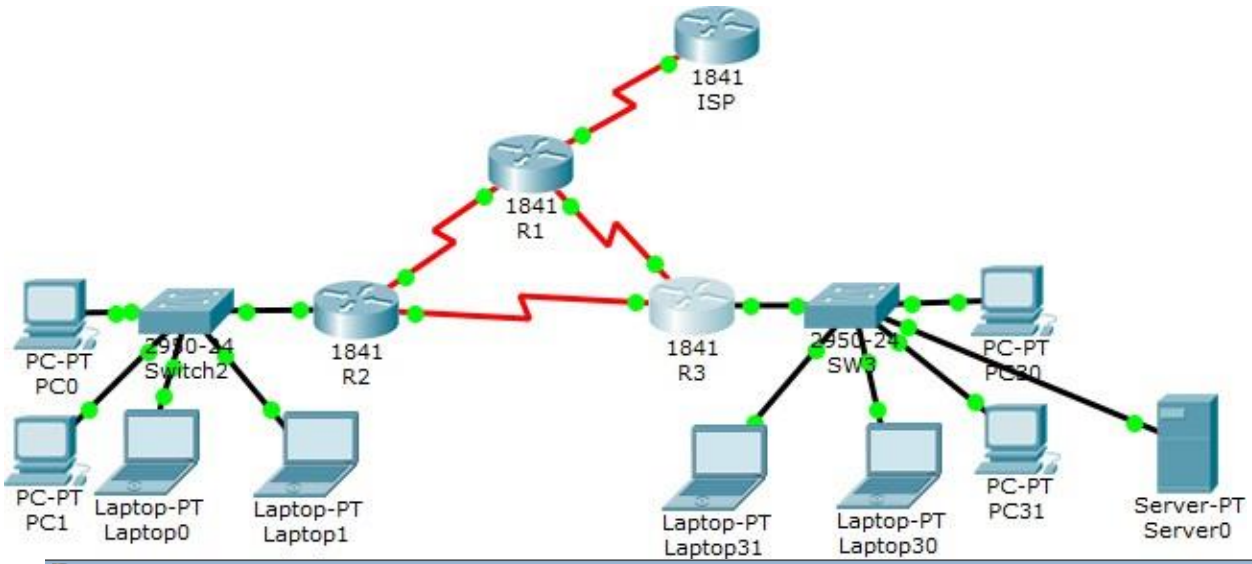
TABLA DE CONTENIDO

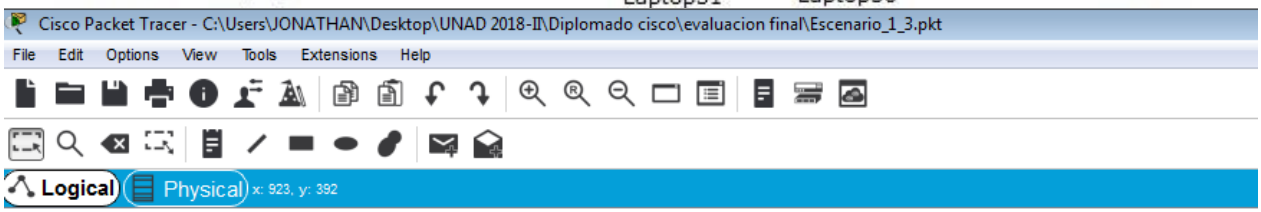
INTRODUCCIÓN

La evaluación denominada “Prueba de habilidades prácticas”, forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, y busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado.

Se realizara acompañamiento de los respectivos procesos de documentación de la solución, correspondientes al registro de la configuración de cada uno de los dispositivos, la descripción detallada del paso a paso de cada una de las etapas realizadas durante su desarrollo, el registro de los procesos de verificación de conectividad mediante el uso de comandos ping, traceroute, show ip route, entre otros.

DESARROLLO PRIMER ESCENARIO





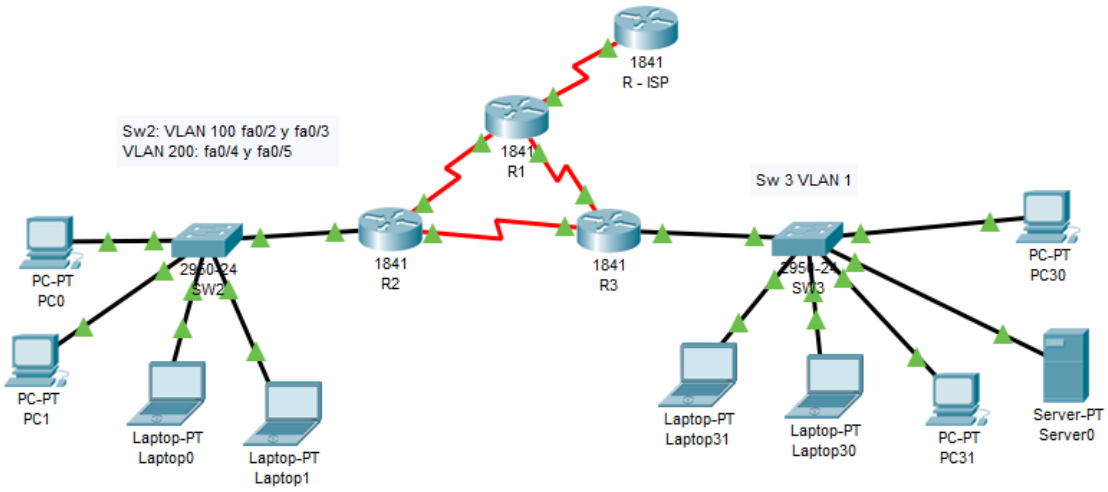


TABLA DE DIRECCIONAMIENTO

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.
- Los puertos de red que no se utilizan se deben deshabilitar.
- La información de dirección **IP R1, R2** y R3 debe cumplir con la tabla 1.
- **Laptop20, Laptop21, PC20, PC21, Laptop30, Laptop31, PC30 y PC31** deben obtener información IPv4 del servidor 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.
- R1 debe tener una ruta estática predeterminada al ISP que se configuró y que incluye esa ruta en el dominio RIPv2.
- R2 es un servidor de DHCP para los dispositivos conectados al puerto FastEthernet0/0.
- R2 debe, además de enrutamiento a otras partes de la red, ruta entre las VLAN 100 y 200.
- El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivos en R3 (ping).
- 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.
- La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual- stack).
- R1, R2 y R3 intercambian información de routing mediante RIP versión 2.
- R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1.
- 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 ACTIVIDAD ESCENARIO 1

Programación en SW2

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 100
Switch(config-vlan)#name LAPTOPS
Switch(config-vlan)#vlan 200
Switch(config-vlan)#name DESTOPS
Switch(config-vlan)#exit
Switch(config)#int range fa0/2-3
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 100
Switch(config-if-range)#int range fa0/4-5
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 200
Switch(config-if-range)#int fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#int range fa0/6-24

Switch(config-if-range)#shut

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 100
Switch(config-vlan)#name LAPTOPS
Switch(config-vlan)#vlan 200
Switch(config-vlan)#name DESTOPS
Switch(config-vlan)#exit
Switch(config)#int range fa0/2-3
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 100
Switch(config-if-range)#int range fa0/4-5
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 200
Switch(config-if-range)#int fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#int range fa0/6-24
Switch(config-if-range)#shut
```

Programación en R2

R2#en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int fa0/0.100
R2(config-subif)#encapsulation dot1Q 100
R2(config-subif)#ip address 192.168.20.1 255.255.255.0
R2(config-subif)#int fa0/0.200

R2(config-subif)#encapsulation dot1Q 200
R2(config-subif)#ip address 192.168.21.1 255.255.255.0
R2(config-subif)#int f0/0
R2(config-if)#no shut
R2(config-if)#int s0/0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#no shut
R2(config)#int s0/0/1
R2(config-if)#ip address 10.0.0.9 255.255.255.252
R2(config-if)#no shut
R2(config-if)#

```
R2(config)#int fa0/0.100
R2(config-subif)#encapsulation dot1Q 100
R2(config-subif)#ip address 192.168.20.1 255.255.255.0
R2(config-subif)#int fa0/0.200
R2(config-subif)#encapsulation dot1Q 200
R2(config-subif)#ip address 192.168.21.1 255.255.255.0
R2(config-subif)#int f0/0
R2(config-if)#no shut
R2(config-if)#int s0/0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int s0/0/1
```

```
R2(config)#int s0/0/1
R2(config-if)#ip address 10.0.0.9 255.255.255.252
R2(config-if)#no shut
R2(config-if)#
```

Programación en R1

R1>en
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int s0/0/0
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#no shut
R1(config-if)#int s0/1/0
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int s0/1/1
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#no shut
R1(config-if)#

```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int s0/0/0
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#no shut
R1(config-if)#int s0/1/0
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int s0/1/1
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#no shut
R1(config-if)#
```

Programación en R3

R3>en
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ipv6 unicast-routing
R3(config)#int f0/0
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)#ipv6 dhcp server vlan_1
R3(config-if)#ipv6 nd other-config-flag
R3(config-if)#no shut
R3(config-if)#int s0/0/0
R3(config-if)#ip address 10.0.0.6 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int s0/0/1
R3(config-if)#ip address 10.0.0.10 255.255.255.252
R3(config-if)#no shut

R3(config-if)#

```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#ipv6 unicast-routing
R3(config)#int f0/0
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)#ipv6 dhcp server vlan_1
R3(config-if)#ipv6 nd other-config-flag
R3(config-if)#no shut
```

```
R3(config-if)#int s0/0/0
R3(config-if)#ip address 10.0.0.6 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int s0/0/1
R3(config-if)#ip address 10.0.0.10 255.255.255.252
R3(config-if)#no shut
R3(config-if)#
```

Configuración DHCP

R2>en
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dhcp pool vlan_100
R2(dhcp-config)#network 192.168.20.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.20.1
R2(dhcp-config)#ip dhcp pool vlan_200
R2(dhcp-config)#default-router 192.168.21.1
R2(dhcp-config)#

```
R2>en
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip dhcp pool vlan_100
R2(dhcp-config)#network 192.168.20.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.20.1
R2(dhcp-config)#ip dhcp pool vlan_200
R2(dhcp-config)#default-router 192.168.21.1
R2(dhcp-config)#
```

R3(config)#ip dhcp pool vlan_1
R3(dhcp-config)#network 192.168.30.1 255.255.255.0
R3(dhcp-config)#default-router 192.168.30.1
R3(dhcp-config)#ipv6 dhcp pool vlan_1
R3(config-dhcpv6)#dns-server 2001:db8:130::
R3(config-dhcpv6)#exit

R3(config)#

```
R3(config)#ip dhcp pool vlan_1
R3(dhcp-config)#network 192.168.30.1 255.255.255.0
R3(dhcp-config)#default-router 192.168.30.1
R3(dhcp-config)#ipv6 dhcp pool vlan_1
R3(config-dhcpv6)#dns-server 2001:db8:130::
R3(config-dhcpv6)#exit
R3(config)#
```

R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#network 192.168.30.0
R2(config-router)#network 192.168.20.0
R2(config-router)#network 192.168.21.0
R2(config-router)#network 10.10.10.0

R2(config-router)#network 10.10.10.8

```
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#network 192.168.30.0
R2(config-router)#network 192.168.20.0
R2(config-router)#network 192.168.21.0
R2(config-router)#network 10.10.10.0
R2(config-router)#network 10.10.10.8
```

```
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)#ip route 0.0.0.0 0.0.0.0 s0/0/0
R1(config)#router rip
R1(config-router)#network 10.0.0.4
R1(config-router)#network 10.0.0.0
R1(config-router)#default-information originate
```

R1(config-router)#

```
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)#ip router 0.0.0.0 0.0.0.0 s0/0/0
                    ^
% Invalid input detected at '^' marker.

R1(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0
R1(config)#router rip
R1(config-router)#network 10.0.0.4
R1(config-router)#network 10.0.0.0
R1(config-router)#default-information originate
R1(config-router)#
```

```
R3>en
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 192.168.0.0
R3(config-router)#network 10.0.0.8
R3(config-router)#network 10.0.0.4
R3(config-router)#exit
R3(config)#
```

R3(config)#

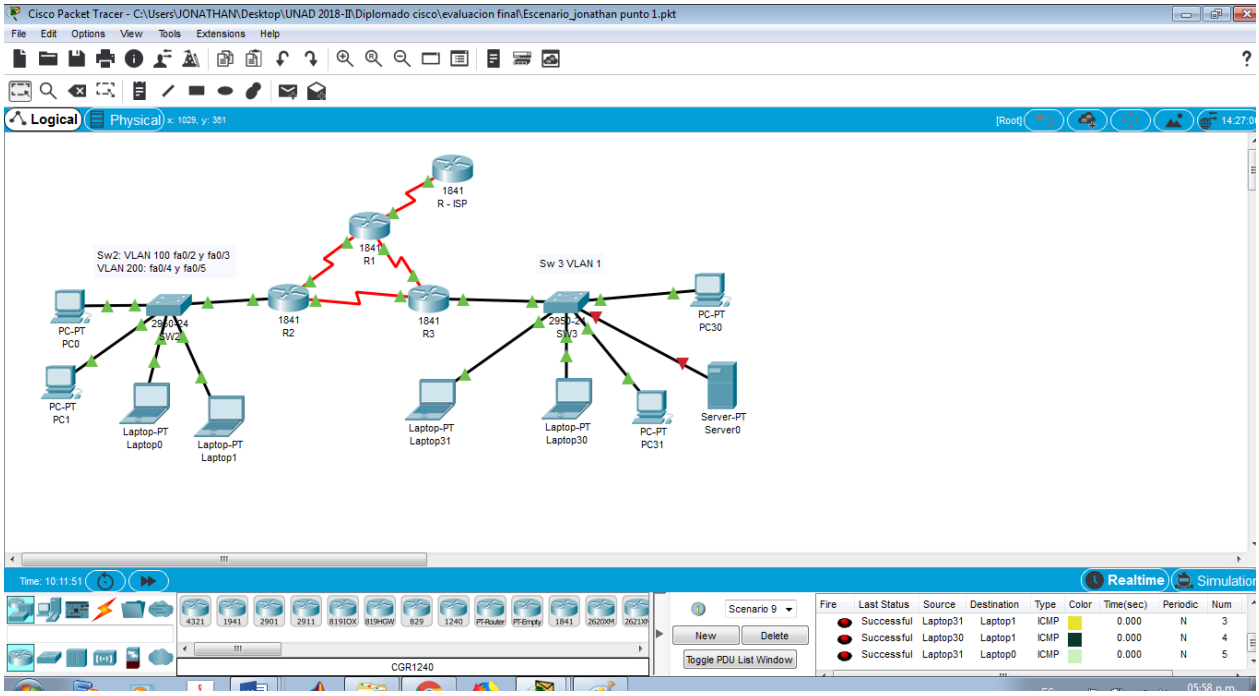
```
R3>en
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router rip
R3(config-router)#version 2
R3(config-router)#network 192.168.0.0
R3(config-router)#network 10.0.0.8
R3(config-router)#network 10.0.0.4
R3(config-router)#exit
R3(config)#
```

R1(config)#ip nat inside source list 1 int s0/0/0 overload
R1(config)#int s0/1/0
R1(config-if)#ip nat inside
R1(config-if)#int s0/1/1
R1(config-if)#ip nat inside
R1(config-if)#int s0/0/0
R1(config-if)#ip nat inside
R1(config-if)#int s0/0/0
R1(config-if)#ip nat outside

R1(config-if)#

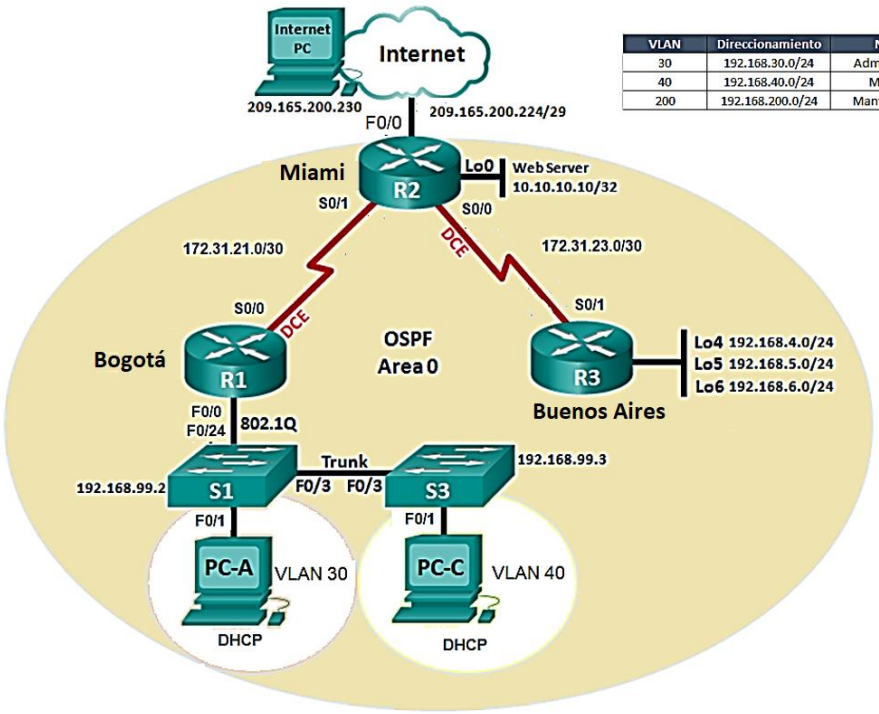
```
R1>en
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip nat pool INSEDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#ip nat pool INSEDE-DEVS 200.123.211.2 200.123.211.128
network 255.255.255.0

% Invalid input detected at '^' marker.

R1(config)#ip nat pool INSEDE-DEVS 200.123.211.2 200.123.211.128
netmask 255.255.255.0
R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255
R1(config)#access-list 1 permit 10.0.0.0 0.0.0.255
R1(config)#ip nat inside source list 1 s0/0/0 overload
                                                ^
```

```
R1(config)#ip nat inside source list 1 int s0/0/0 overload
R1(config)#int s0/1/0
R1(config-if)#ip nat inside
R1(config-if)#int s0/1/1
R1(config-if)#ip nat inside
R1(config-if)#int s0/0/0
R1(config-if)#ip nat inside
R1(config-if)#int s0/0/0
R1(config-if)#ip nat outside
R1(config-if)#
```

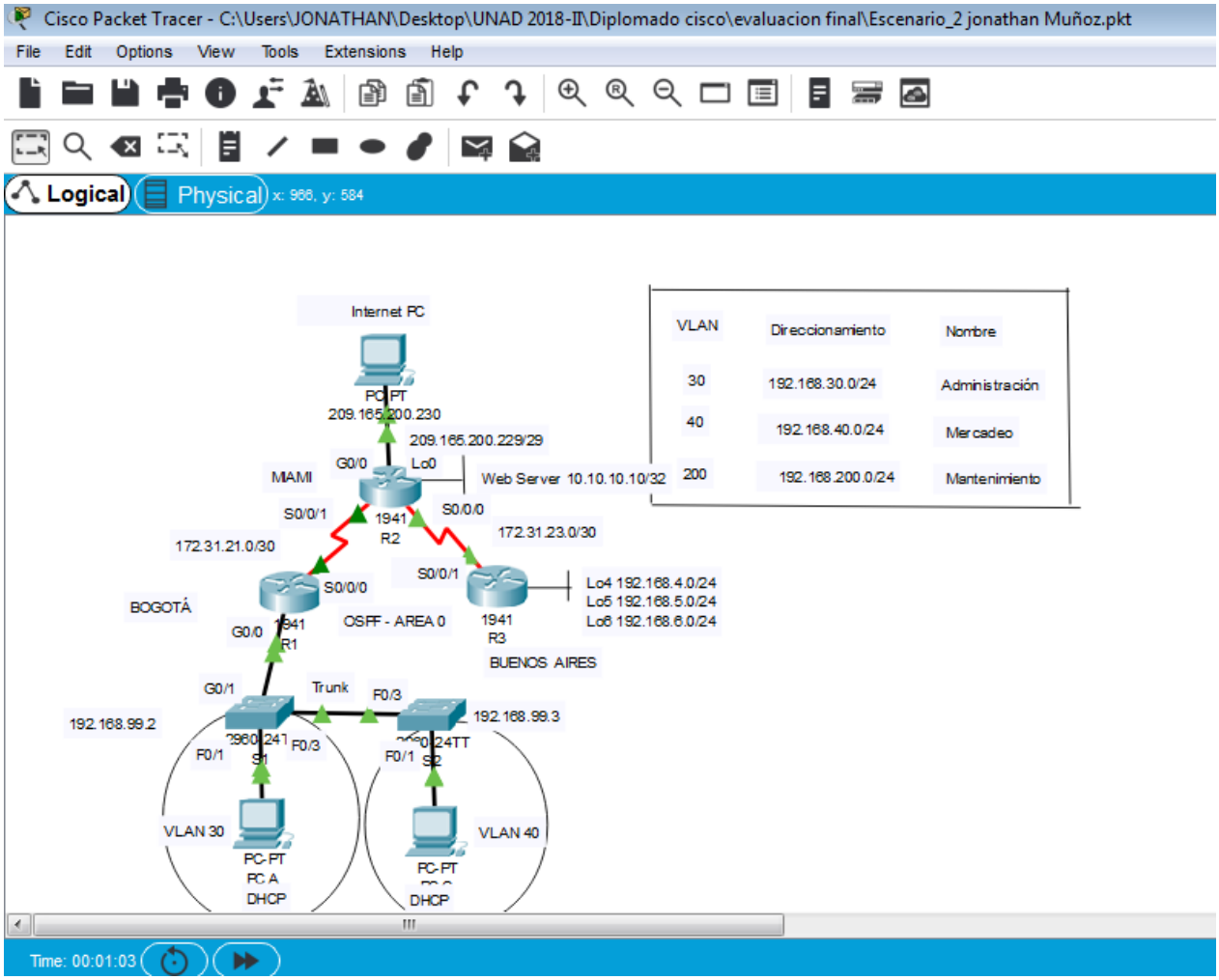

Cisco Packet Tracer - C:\Users\JONATHAN\Desktop\UNAD 2018-II\Diplomado cisco\evaluacion final\Escenario_jonathan punto 1.pkt
File Edit Options View Tools Extensions Help
Logical
Physical
1841
R - ISP
1841
R1
Sw2: VLAN 100 fa0/2 y fa0/3
VLAN 200: fa0/4 y fa0/5
Sw 3 VLAN 1
PC-PT
PC0
1841
R2
1841
R3
PC-PT
PC30
PC-PT
PC1
Laptop-PT
Laptop0
Laptop-PT
Laptop1
Laptop-PT
Laptop31
Laptop-PT
Laptop30
PC-PT
PC31
Server-PT
Server0
Realtime
Simulation
Scenario 9
New
Delete
Toggle PDU List Window
CGR1240
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Successful Laptop31 Laptop1 ICMP 0.000 N 3
Successful Laptop30 Laptop1 ICMP 0.000 N 4
Successful Laptop31 Laptop0 ICMP 0.000 N 5

DESARROLLO SEGUNDO 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.



VLAN	Direccionamiento	Nombre
30	192.168.30.0/24	Administración
40	192.168.40.0/24	Mercadeo
200	192.168.200.0/24	Mantenimiento



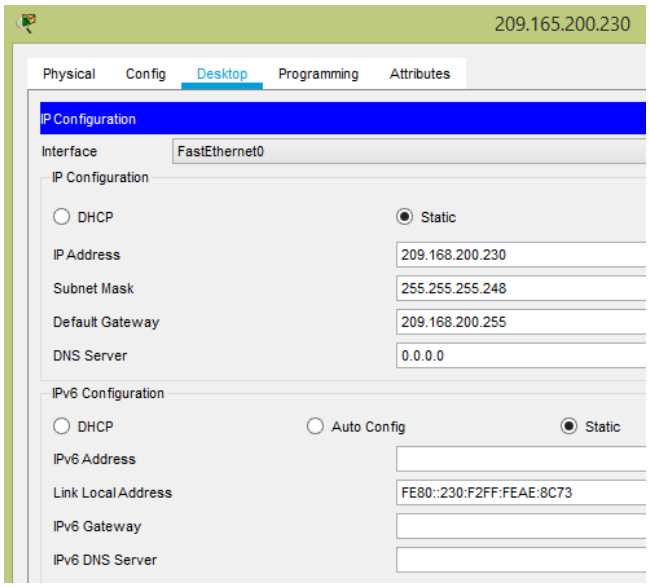
Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario.

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Gateway predeterminado
R1(Bogotá)	G0/0	192.168.30.1	255.255.255.0	N/A
	S0/0/0	172.31.21.1	255.255.255.252	N/A
R2(Miami)	S0/0/1	172.31.21.2	255.255.255.252	N/A
	S/0/0/0	172.31.23.1	255.255.255.252	N/A
	G0/0	209.165.200.229	255.255.255.248	N/A

	Lo0	10.10.10.10	255.255.255.255	N/A
R3 (Buenos Aires)	S0/0/1	172.31.23.2	255.255.255.252	N/A
	Lo4	192.168.4.1	255.255.255.0	N/A
	Lo5	192.168.5.1	255.255.255.0	N/A
	Lo6	192.168.6.1	255.255.255.0	N/A
PC-A	NIC	DHCP	DHCP	DHCP
PC-C	NIC	DHCP	DHCP	DHCP
PC-Internet	NIC	209.165.200.230	255.255.255.248	209.165.200.255

Configuración de los host:

PC Internet



Configuración R1 - Router Bogotá

Router>en
Router#conf t
Router(config)#hostname R1
R1(config)#interface g0/0
R1(config-if)#ip address 192.168.30.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit

```
R1(config)#interface s0/0/0
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#end
R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
        R1#
```

Configuración R2 - Router Miami

```
Router>enable
Router#confi term
Router(config)#hostname R2
R2(config)#inter s0/0/1
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shutdown
R2(config)#exit
R2(config)#inter s0/0/0
R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#inter g0/0
R2(config-if)#ip address 209.165.200.229 255.255.255.248
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#inter loopback 0
R2(config-if)#ip address 10.10.10.10 255.255.255.255
R2(config-if)#end
R2#copy run start
R2#
```

Configuración R3 - Router Buenos Aires

```
Router(config)#hostname R3
R3(config)#interface s0/0/1
R3(config-if)#ip address 172.31.23.2 255.255.255.252
R3(config-if)#no shut
R3(config-if)#exit
R3(config)#inter loopback 4
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#exit
R3(config)#inter loopback 5
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#no shut
```

```
R3(config-if)#exit
R3(config)#inter loopback 6
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#end
R3#copy run start
        R3#
```

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

Configuración OSPF R1

```
R1>enable
R1#confi term
R1(config)#route ospf 1
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#router-id 1.1.1.1
R1(config-router)#passive-interface g0/0
  R3(config-router)#exit
  R3(config)#interface s0/0/0
  R3(config-if)#bandwidth 256
  R3(config-if)#ip ospf cost 9500
  R3(config-if)#end
R1#copy run start
R1#
```

Configuración OSPF R2

```
R2>enable
R2#configure termi
R2(config)#route ospf 1
R2(config-router)#network 172.31.21.0 0.0.0.255 area 0
R2(config-router)#network 172.31.23.0 0.0.0.255 area 0
R2(config-router)#router-id 5.5.5.5
R2(config-router)#passive-interface g0/0
R2(config-router)#exit
R2(config)#interface s0/0/0
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#exit
R2(config)#interface s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#end
R2#copy run start
          R2#
```

Configuración OSPF R3

```
R3>enable
R3#configure terminal
R3(config)#route ospf 1
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#router-id 8.8.8.8
R3(config-router)#exit
R3(config)#interface s0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#ip ospf cost 9500
R3(config-if)#end
R3#copy run start
R3#
```

Verificar información de OSPF

Visualizar tablas de enrutamiento y routers conectados por OSPFv2

```
R1#show ip route ospf 1
     172.31.0.0/16 is variably subnetted, 3 subnets, 2 masks
O       172.31.23.0 [110/19000] via 172.31.21.2, 00:11:27, Serial0/0/0

R1#
```

```
R2#show ip route ospf 1
R2#
```

```
R3>enable
R3#show ip route ospf
     172.31.0.0/16 is variably subnetted, 3 subnets, 2 masks
O       172.31.21.0 [110/19000] via 172.31.23.1, 00:22:32, Serial0/0/1

R3#
```

```
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 0.0.0.255 area 0
    172.31.23.0 0.0.0.255 area 0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    5.5.5.5              110      00:09:13
    10.10.10.10          110      00:26:13
    192.168.6.1          110      00:09:13
    192.168.30.1         110      00:09:14
  Distance: (default is 110)

R2#
```

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

```
R1#show ip ospf interface s0/0/0

Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.21.1/30, Area 0
  Process ID 1, Router ID 192.168.30.1, 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
    Hello due in 00:00:01
  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)
```

```
R2>enable
R2#show ip ospf interface s0/0/0

Serial0/0/0 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: 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 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 192.168.6.1
  Suppress hello for 0 neighbor(s)
R2#show ip ospf interface s0/0/1

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 00:00:00
  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 192.168.30.1
  Suppress hello for 0 neighbor(s)
R2#
```

```
R3>enable
R3#show ip ospf interface s0/0/1

Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.23.2/30, Area 0
  Process ID 1, Router ID 192.168.6.1, 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
    Hello due in 00:00:07
  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)
R3#
```

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

```
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
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:00:45
    5.5.5.5              110      00:01:36
    8.8.8.8              110      00:00:45
    192.168.6.1          110      00:04:48
    192.168.30.1         110      00:04:47
  Distance: (default is 110)

R1#
```

```
R2>enable
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 0.0.0.255 area 0
    172.31.23.0 0.0.0.255 area 0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:02:43
    5.5.5.5              110      00:03:34
    8.8.8.8              110      00:02:43
    192.168.6.1          110      00:06:47
    192.168.30.1         110      00:06:46
  Distance: (default is 110)

R2#
```

```
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
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:14:36
    5.5.5.5              110      00:15:28
    8.8.8.8              110      00:14:36
    192.168.6.1          110      00:18:40
    192.168.30.1         110      00:18:39
  Distance: (default is 110)

R3#
```

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

Resumen de las VLANS a Configurar

Nombre	***Dirección***	***Mascara***
VLAN 30: Admin	192.168.30.0	255.255.255.0
VLAN 40: Mercadeo	192.168.40.0	255.255.255.0
VLAN 200: Mtto	192.168.200	255.255.255.0

Resumen de las interfaces de los equipos relacionadas con las VLANS

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Gateway predeterminado
R1	G0/0.1	192.168.99.1	255.255.255.0	N/A
	G0/0.30	192.168.30.1	255.255.255.0	N/A
	G0/0.40	192.168.40.1	255.255.255.0	N/A
S1	VLAN 99	192.168.99.2	255.255.255.0	192.168.99.1
S2	VLAN 99	192.168.99.3	255.255.255.0	192.168.99.1
PC-A	NIC	DHCP	255.255.255.0	192.168.30.1
PC-B	NIC	DHCP	255.255.255.0	192.168.40.1

Resumen de los enlaces de las VLANS

Puertos	Asignaciones	Red
S1 F0/3	Enlace troncal de 802.1Q	N/A
S3 F0/3	Enlace troncal de 802.1Q	N/A
S1 G0/0	Enlace troncal de 802.1Q	N/A
S1 F0/1	VLAN 30: Administración	192.168.30.0/24
S3 F0/1	VLAN 40: Mercadeo	192.168.40.0/24

Configuración Switch 1

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
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 200
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
S1(config-if)#ip address 192.168.200.2 255.255.255.0
S1(config-if)#no ip address 192.168.200.2 255.255.255.0
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)#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 Vlan200, changed state to up
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int g0/1
S1(config-if)#switchport mode trunk
S1(config-if)#no shutdown
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed
state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed
state to up
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4-23, g0/2
S1(config-if-range)#switchport mode access
S1(config-if-range)#int f0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
```

```
S1(config-if)#int range fa0/2, fa0/4-23, g0/1-2
S1(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively
down
%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 GigabitEthernet0/2, changed state to administratively down
S1(config-if-range)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down
S1(config-if-range)#end
S1#
%SYS-5-CONFIG_I: Configured from console by console
S1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S1#

Configuración Switch 2

Switch>enable
Switch#confi ter
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#vlan 30
S2(config-vlan)#name Administracion
S2(config-vlan)#vlan 40
S2(config-vlan)#name Mercadeo
S2(config-vlan)#vlan 200
S2(config-vlan)#name Mantenimiento
S2(config-vlan)#exit
S2(config)#int vlan 200
S2(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to up
S2(config-if)#ip address 192.168.99.3 255.255.255.0
S2(config-if)#no shutdown
S2(config-if)#exit
S2(config)#ip default-gateway 192.168.99.1
S2(config)#int fa0/3
S2(config-if)#switchport mode trunk
S2(config-if)#switchport trunk native vlan 1
S2(config-if)#int range fa0/1-2, fa0/4-24, g0/1-2
S2(config-if-range)#switchport mode access
S2(config-if-range)#int f0/1
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 40

```
S2(config-if)#int range fa0/2, fa0/4-24, g0/1-2
S2(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to administratively
down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively
down
%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
```

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
S2(config-if-range)#
S2(config-if-range)#end
S2#
%SYS-5-CONFIG_I: Configured from console by console
S2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S2#

Configuración Router 1

R1>enable
R1#configure ter
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int g0/0.30
R1(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.30, changed state to up
R1(config-subif)#description Admon LAN
R1(config-subif)#encapsulation dot1q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
% 192.168.30.0 overlaps with GigabitEthernet0/0
R1(config-subif)#exit
R1(config)#int g0/0
R1(config-if)#no ip address
R1(config-if)#exit
R1(config)#int g0/0.30
R1(config-subif)#description Admon LAN
R1(config-subif)#encapsulation dot1q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#int g0/0.40
R1(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.40, changed state to up
R1(config-subif)#description LAN Mercadeo
R1(config-subif)#encapsulation dot1q 40
R1(config-subif)#ip address 192.168.40.1 255.255.255.0
R1(config-subif)#int g0/0.200
R1(config-subif)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0.200, changed state to up
R1(config-subif)#description LAN Mantenimiento
R1(config-subif)#encapsulation dot1q 200
R1(config-subif)#ip address 192.168.200.1 255.255.255.0
R1(config-subif)#int g0/0

```
R1(config-if)#no shutdown
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

En el Switch 3 (SW 2) deshabilitar DNS lookup

Se usa el comando no ip domain-lookup.

```
S2>enable
S2#conf term
Enter configuration commands, one per line. End with CNTL/Z.
S2(config)#no ip domain-lookup
S2(config)#
```

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

Realizado en el punto 3.

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

Realizado en el punto 3.

- Implement DHCP and NAT for IPv4

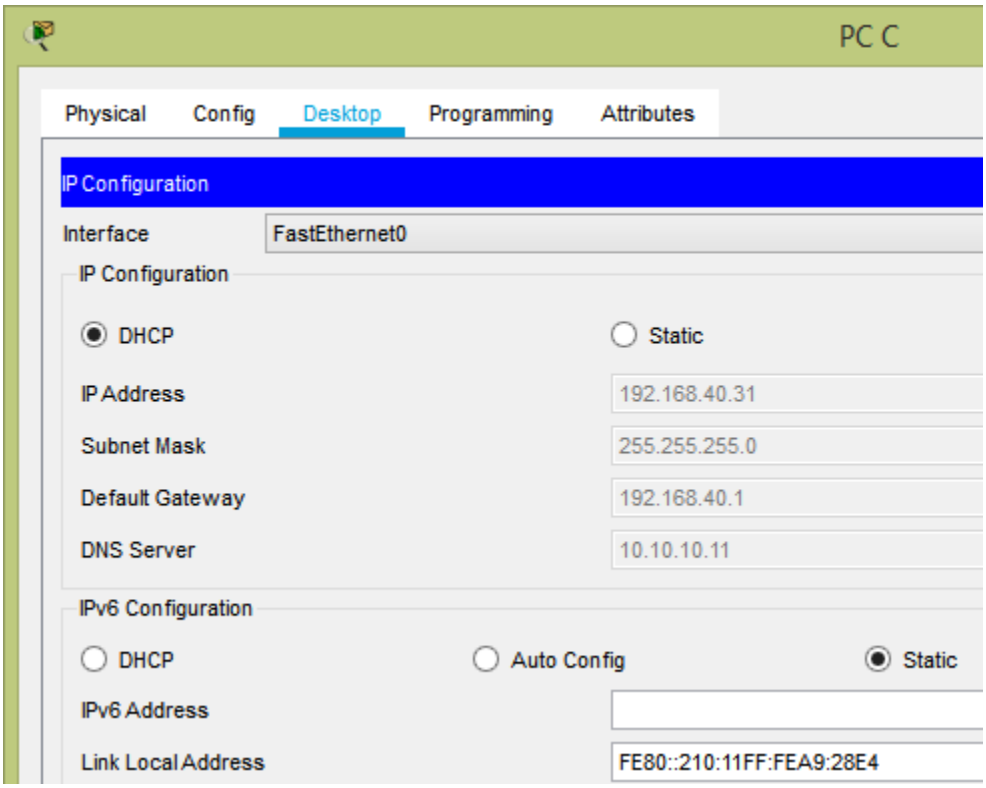
- Configurar R1 como servidor DHCP para las VLANs 30 y 40.

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

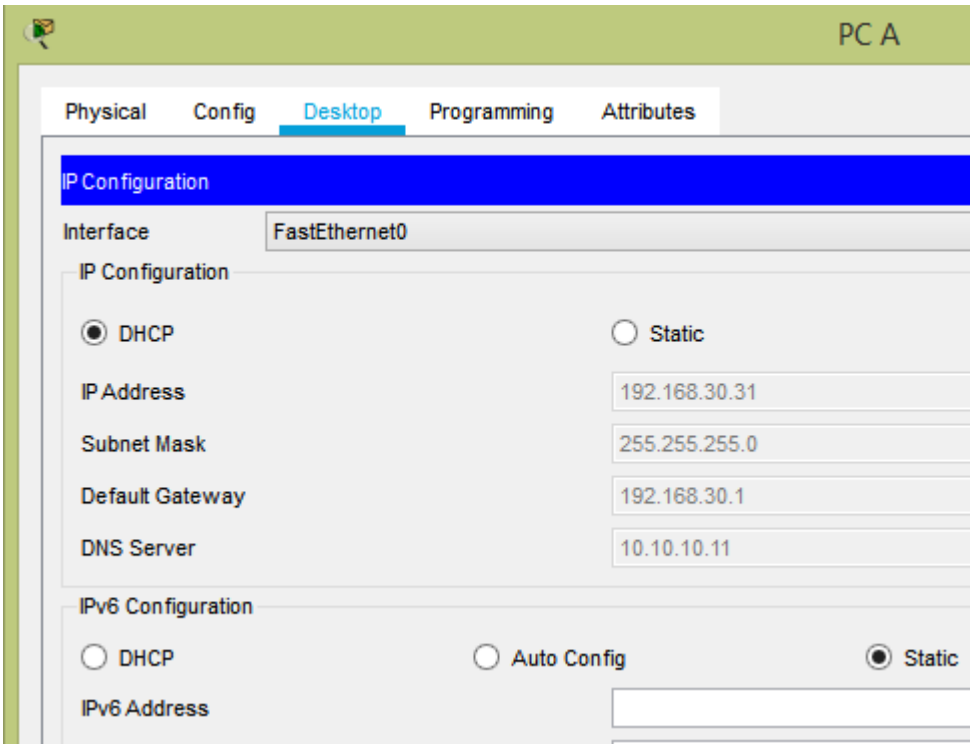
Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.

```
R1>enable
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 admon
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#DNS-SERVER 10.10.10.11
R1(dhcp-config)#domain-name ccna-unad.com
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#ip dhcp pool Mercadeo
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#DNS-SERVER 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#domain-name ccna-unad.com
R1(dhcp-config)#exit
R1(config)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
R1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R1#
```

Evidencia de DHCP en funcionamiento en PC-C



Evidencia de DHCP en funcionamiento en PC-A



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

```
R2>enable
R2#conf term
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip access-list standard Empresa
R2(config-std-nacl)#permit 192.168.0.0 0.0.255.255
R2(config-std-nacl)#exit
R2(config)#interface s0/0/1
R2(config-if)#ip nat inside
R2(config-if)#exit
R2(config)#interface s0/0/0
R2(config-if)#ip nat inside
R2(config-if)#exit
R2(config)#interface g0/0
R2(config-if)#ip nat outside
R2(config-if)#exit
R2(config)#ip nat inside source list Empresa interface g0/0 overload
R2(config)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#copy run star
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
```

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.

ACL 5: Esta ACL implementada en la interface S0/0/1 de R3 deniega el tráfico de la red 192.168.5.0/24 hacia el R2.

```
R3>enable
R3#config term
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#access-list 5 deny 192.168.5.0 0.0.0.255
R3(config)#access-list 5 permit host 0.0.0.0
R3(config)#interface s0/0/1
R3(config-if)#ip access-group 5 out
R3(config-if)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#copy run start
```

Destination filename [startup-config]?
Building configuration...
[OK]
R3#

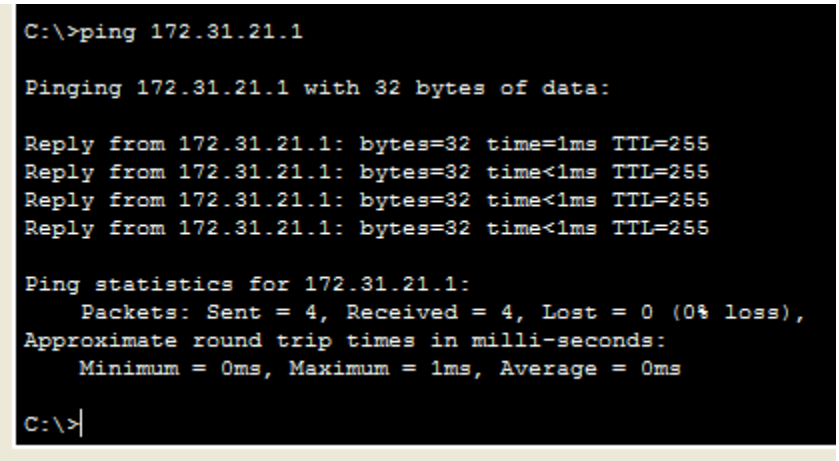
ACL 8: Esta ACL implementada en la interface S0/0/0 de R2 deniega el tráfico de la red 192.168.200.0/24 hacia el R2.

R1>enable
R1#config term
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#access-list 8 deny 192.168.200.0 0.0.0.255
R1(config)#access-list 8 permit host 0.0.0.0
R1(config)#interface s0/0/0
R1(config-if)#ip access-group 8 out
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#copy run sta
Destination filename [startup-config]?
Building configuration...
[OK]
R1#

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

Ping y tracert PC A a serial router 1



```
C:\>tracert 172.31.21.1

Tracing route to 172.31.21.1 over a maximum of 30 hops:

  1    1 ms      1 ms      1 ms      172.31.21.1

Trace complete.

C:\>
```

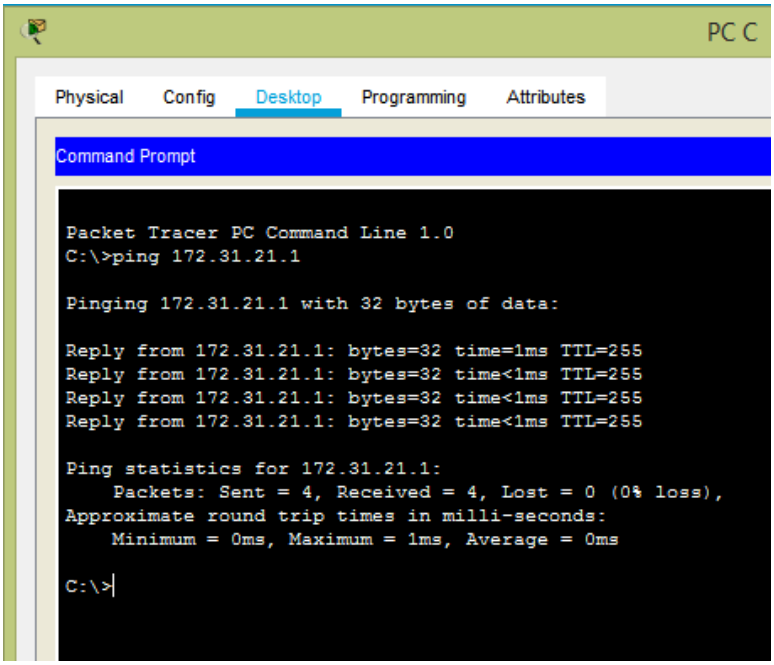
Ping de R1 a R2 y R3

```
R1#ping 172.31.23.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 2/4/11 ms

R1#ping 172.31.23.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/3/12 ms

R1#
```

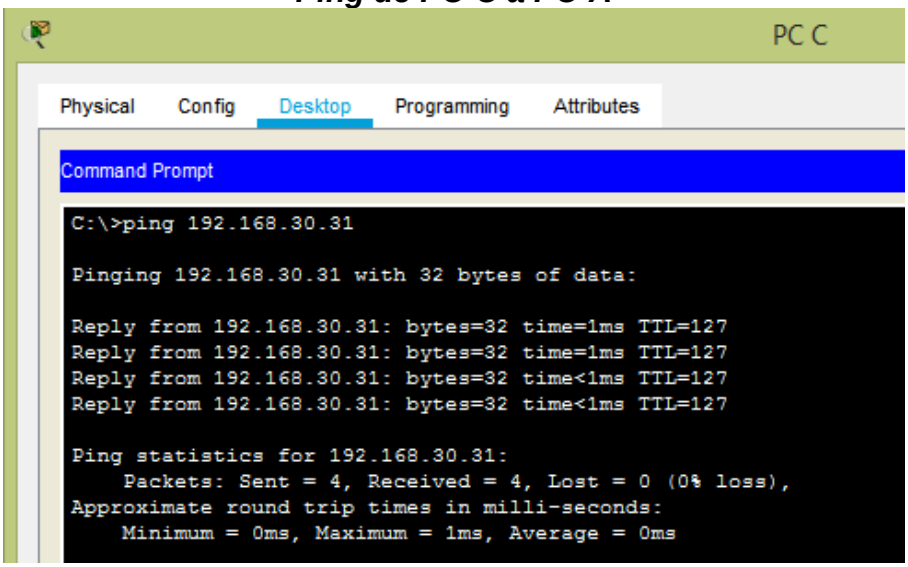
Traceroute de R1 a R2 y R3

```
  1   172.31.21.2     8 msec    1 msec    0 msec
  2   172.31.21.1     0 msec    2 msec    2 msec
R1#traceroute 172.31.21.2
Type escape sequence to abort.
Tracing the route to 172.31.21.2

  1   172.31.21.2     0 msec    1 msec    1 msec
R1#
```

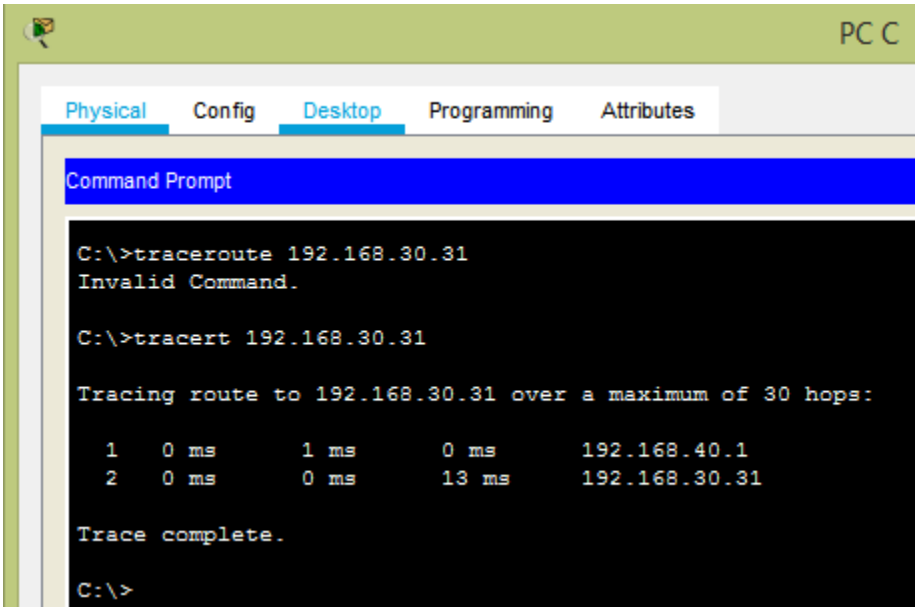
Ping PC-C a Salida R1



Ping de PC-C a PC-A



Tracert de PC-C a PC-A



CONCLUSIONES

Al realizar la actividad denominada “Prueba de habilidades prácticas”, se logró identificar el grado de desarrollo en competencias y habilidades que fueron adquiridas a lo largo del diplomado de Profundización CCNA, se realizó acompañamiento por medio de pantallazos en cada una de las etapas de programación de los elementos en cada esenario, se usaron comandos ping, traceroute, show ip route, entre otros para confirmar y garantizar configuración de los elementos en cada topología.

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