

PRUEBA DE HABILIDADES CCNA

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RESUMEN

Los principios básicos del routing y el switching estudiados durante el curso de CCNA 2, fortalecen las habilidades necesarias para aplicarlas en un campo de acción por lo tanto se presenta una descripción de un escenario, en una empresa de tecnología con tres sucursales, en las ciudades donde el administrador de esta red debe solucionar los problemas e interconectar los dispositivos correctamente siguiendo las especificaciones dadas por la red, protocolos de enrutamiento y topología de la red.

En el estudio de nuestro diplomado se proporciona los elementos para diseño y configuración de una red.

En este informe se muestra la arquitectura y la configuración básica de los routers y switches para su funcionamiento, la creación y configuración de vlans, enlaces troncales, la asignación de protocolo ospf de área única y dhcp en una red simulada de un escenario real

INTRODUCCION

Mediante la Elaboración del siguiente Trabajo escrito se busca poner en práctica lo aprendido en el curso de CCNA1 y CCNA2, como lo fueron la configuración de diferentes equipos como lo son Router, Swiches y Host, mediante la aplicación de los diferentes Protocolos de Routing, En este caso se utilizó el DHCP para poder designar ips de forma dinámica y precisa, evitando equívocos y duplicidad en ellas

También se podrá en práctica la utilización de protocolos de enrutamiento como los son el OSPF y el RIP V2, se crearán VLAN y se procederá a aplicar aspectos los cuales permiten mejorar la seguridad de dichas configuraciones.

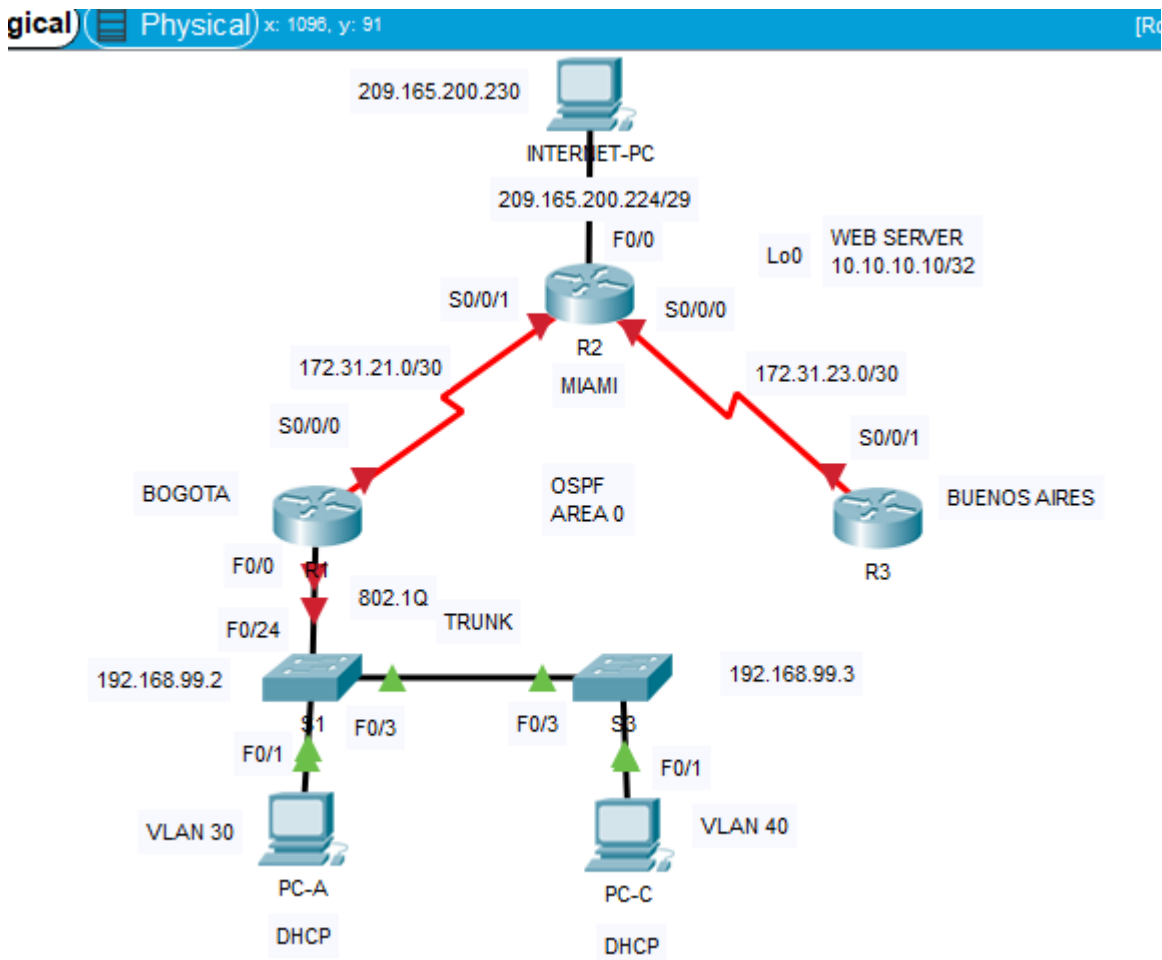
También se procederá a la desactivación de las interfaces que no se utilicen lo cual permite tener un gran factor de seguridad ya que esto impide que cualquier persona inescrupulosa se pueda conectar a cualquier dispositivo y poder ingresar de manera fraudulenta a la red.

Se realizarán la elaboración de dos ejercicios en dos escenarios diferentes en los cuales se pondrá comprobar nuestros conocimientos adquiridos a lo largo del curso; **la clave para los dispositivos (Router y Swiches) es cisco.**

CONTENIDO

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

ROUTER R1

```
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#
R1(config)#service password-encryption
R1(config)#
R1(config)#enable secret cisco
R1(config)#
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#logging synchronous
R1(config-line)#login
R1(config-line)#exit
R1(config)#
R1(config)#line vty 0 15
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#
R1(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO AUTORIZADO
R1(config)#int f0/0
R1(config-if)#ip address 192.168.99.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#int s0/0/0
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#clock rate 128000
R1(config-if)#no shut
```

ROUTER R2

```
Router(config)#hostname R2
R2(config)#no ip domain-lookup
R2(config)#
R2(config)#service password-encryption
R2(config)#
R2(config)#enable secret cisco
R2(config)#
R2(config)#line console 0
R2(config-line)#password cisco
R2(config-line)#logging synchronous
R2(config-line)#login
R2(config-line)#exit
R2(config)#
R2(config)#line vty 0 15
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#
R2(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO AUTORIZADO
R2(config)#int s0/0/1
R2(config-if)#ip add 172.31.21.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#
R2(config-if)#int f0/0
R2(config-if)#ip add 209.165.200.225 255.255.255.248
R2(config-if)#no shut
R2(config-if)#
R2(config-if)#int s0/0/0
R2(config-if)#ip add 172.31.23.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int s0/0/0
R2(config-if)#clock rate 128000
R2(config-if)#exit
```


ROUTER 3

```
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#
R3(config)#service password-encryption
R3(config)#
R3(config)#enable secret cisco
R3(config)#
R3(config)#line console 0
R3(config-line)#password cisco
R3(config-line)#logging synchronous
R3(config-line)#login
R3(config-line)#exit
R3(config)#
R3(config)#line vty 0 15
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#
R3(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO AUTORIZADO
R3(config)#int s0/0/1
R3(config-if)#ip address 172.31.23.1 255.255.255.252
R3(config-if)#no shut
R3(config-if)#
```

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

ROUTER 1

```
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 172.31.21.0 0.0.0.3 area 0
R1(config-router)#network 192.168.30.0 0.0.0.255 area 0
R1(config-router)#network 192.168.40.0 0.0.0.255 area 0
R1(config-router)#network 192.168.200.0 0.0.0.255 area 0
R1(config-router)#exit
```

Ancho de Banda

```
R1(config)#int s0/0/0
R1(config-if)#bandwidth 256
```

Costo de métrica en S0/0/0

```
R1(config-if)#ip ospf cost 9500
R1(config-if)#exit
```

Interfaces LAN pasivas

```
R1(config)#router ospf 1
R1(config-router)#passive-interface f0/0
R1(config-router)#passive-interface f0/1
R1(config-router)#end
R1#
```

ROUTER 2

```
R2(config)#router ospf 1
R2(config-router)#router-id 5.5.5.5
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#network 10.10.10.10 0.0.0.0 area 0
R2(config-router)#
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
R2(config-router)#network 209.165.200.224 0.0.0.7 area 0
R2(config-router)#exit
```

Ancho de Banda

```
R2(config)#int s0/0/0
R2(config-if)#bandwidth 256
```

Costo de métrica en S0/0/0

```
R2(config-if)#ip ospf cost 9500
R2(config-if)#exit
```

Interfaces LAN pasivas

```
R2(config)#router ospf 1
R2(config-router)#passive-interface f0/0
R2(config-router)#passive-interface f0/1
R2(config-router)#end
```

ROUTER 3

```
R3(config)#router ospf 1
R3(config-router)#router-id 8.8.8.8
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#network 192.168.4.0 0.0.0.255 area 0
R3(config-router)#network 192.168.5.0 0.0.0.255 area 0
R3(config-router)#network 192.168.6.0 0.0.0.255 area 0
R3(config-router)#
R3(config-router)#exit
```

Ancho de Banda

```
R3(config)#int s0/0/0
R3(config-if)#bandwidth 256
```

Costo de métrica en S0/0/0

```
R3(config-if)#ip ospf cost 9500
R3(config-if)#exit
```

Interfaces LAN pasivas

```
R3(config)#router ospf 1
R3(config-router)#passive-interface f0/0
R3(config-router)#passive-interface f0/1
R3(config-router)#
```

```
R3(config)#int Lo4
R3(config-if)#ip address 192.168.4.1 255.255.255.0
R3(config-if)#exit
R3(config)#int Lo5
R3(config-if)#
R3(config-if)#ip address 192.168.5.1 255.255.255.0
R3(config-if)#exit
R3(config)#int Lo6
R3(config-if)#
R3(config-if)#ip address 192.168.6.1 255.255.255.0
R3(config-if)#
```

1. 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
- Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.

```
Gateway of last resort is not set

  10.0.0.0/32 is subnetted, 1 subnets
O   10.10.10.10 [110/65] via 172.31.21.2, 03:34:37, Serial0/0/0
  172.31.0.0/30 is subnetted, 2 subnets
C   172.31.21.0 is directly connected, Serial0/0/0
O   172.31.23.0 [110/128] via 172.31.21.2, 03:34:37, Serial0/0/0
  192.168.4.0/32 is subnetted, 1 subnets
O   192.168.4.1 [110/129] via 172.31.21.2, 03:34:37, Serial0/0/0
  192.168.5.0/32 is subnetted, 1 subnets
O   192.168.5.1 [110/129] via 172.31.21.2, 03:34:37, Serial0/0/0
  192.168.6.0/32 is subnetted, 1 subnets
O   192.168.6.1 [110/129] via 172.31.21.2, 03:34:37, Serial0/0/0
C   192.168.30.0/24 is directly connected, FastEthernet0/0.30
C   192.168.40.0/24 is directly connected, FastEthernet0/0.40
C   192.168.200.0/24 is directly connected, FastEthernet0/0.200
  209.165.200.0/29 is subnetted, 1 subnets
O   209.165.200.224 [110/65] via 172.31.21.2, 03:34:37,
Serial0/0/0
```

```
R1#show ip ospf int
```

```
FastEthernet0/0 is up, line protocol is up
  Internet address is 192.168.99.1/24, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type BROADCAST, Cost: 1
  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 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 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.21.1/30, Area 0
  Process ID 1, Router ID 1.1.1.1, Network Type POINT-TO-POINT, Cost:
9500
  Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
  No designated router on this network
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit
5
  Hello due in 00:00:06
  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 5.5.5.5
  Suppress hello for 0 neighbor(s)
R1#
```

```
R1#show ip ospf neig
```

```
Neighbor ID      Pri   State           Dead Time   Address
Interface
5.5.5.5          0    FULL/ -         00:00:36   172.31.21.2
Serial0/0/0
R1#
```

R1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Suppress hello for 0 neighbor(s)
R1#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 1.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.21.0 0.0.0.3 area 0
    192.168.30.0 0.0.0.255 area 0
    192.168.40.0 0.0.0.255 area 0
    192.168.200.0 0.0.0.255 area 0
  Passive Interface(s):
    FastEthernet0/0
    FastEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:10:19
    5.5.5.5          110          00:15:54
    8.8.8.8          110          00:15:55
  Distance: (default is 110)
```

ROUTER 2

R2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

  10.0.0.0/32 is subnetted, 1 subnets
C    10.10.10.10 is directly connected, Loopback0
  172.31.0.0/30 is subnetted, 2 subnets
C    172.31.21.0 is directly connected, Serial0/0/0
C    172.31.23.0 is directly connected, Serial0/0/1
  192.168.4.0/32 is subnetted, 1 subnets
O    192.168.4.1 [110/65] via 172.31.23.1, 03:48:26, Serial0/0/1
  192.168.5.0/32 is subnetted, 1 subnets
O    192.168.5.1 [110/65] via 172.31.23.1, 03:48:26, Serial0/0/1
  192.168.6.0/32 is subnetted, 1 subnets
O    192.168.6.1 [110/65] via 172.31.23.1, 03:48:26, Serial0/0/1
O    192.168.30.0/24 [110/65] via 172.31.21.1, 00:12:03, Serial0/0/0
O    192.168.40.0/24 [110/65] via 172.31.21.1, 00:11:53, Serial0/0/0
O    192.168.200.0/24 [110/65] via 172.31.21.1, 00:11:53, Serial0/0/0
  209.165.200.0/29 is subnetted, 1 subnets
C    209.165.200.224 is directly connected, FastEthernet0/0

R2#
```

```
R2#show ip ospf int
```

```
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:
64
  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 00:00:03
    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 1.1.1.1
    Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
  Internet address is 172.31.23.2/30, Area 0
  Process ID 1, Router ID 5.5.5.5, Network Type POINT-TO-POINT, Cost:
9500
```

```
R2#show ip ospf neig
```

Neighbor ID	Pri	State	Dead Time	Address
Interface				
1.1.1.1	0	FULL/ -	00:00:35	172.31.21.1
Serial0/0/1				
8.8.8.8	0	FULL/ -	00:00:38	172.31.23.1
Serial0/0/0				

```
R2#
```

```
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 8.8.8.8
  Suppress hello for 0 neighbor(s)
R2#
```

```
R2#show ip protocols
```

```
Routing Protocol is "ospf 1"
```

```
Outgoing update filter list for all interfaces is not set
```

```
Incoming update filter list for all interfaces is not set
```

```
Router ID 5.5.5.5
```

```
Number of areas in this router is 1. 1 normal 0 stub 0 nssa
```

```
Maximum path: 4
```

```
Routing for Networks:
```

```
172.31.21.0 0.0.0.3 area 0
```

```
172.31.23.0 0.0.0.3 area 0
```

```
209.165.200.0 0.0.0.7 area 0
```

```
10.10.10.10 0.0.0.0 area 0
```

```
Passive Interface(s):
```

```
FastEthernet0/0
```

```
FastEthernet0/1
```

```
Routing Information Sources:
```

```
Gateway Distance Last Update
```

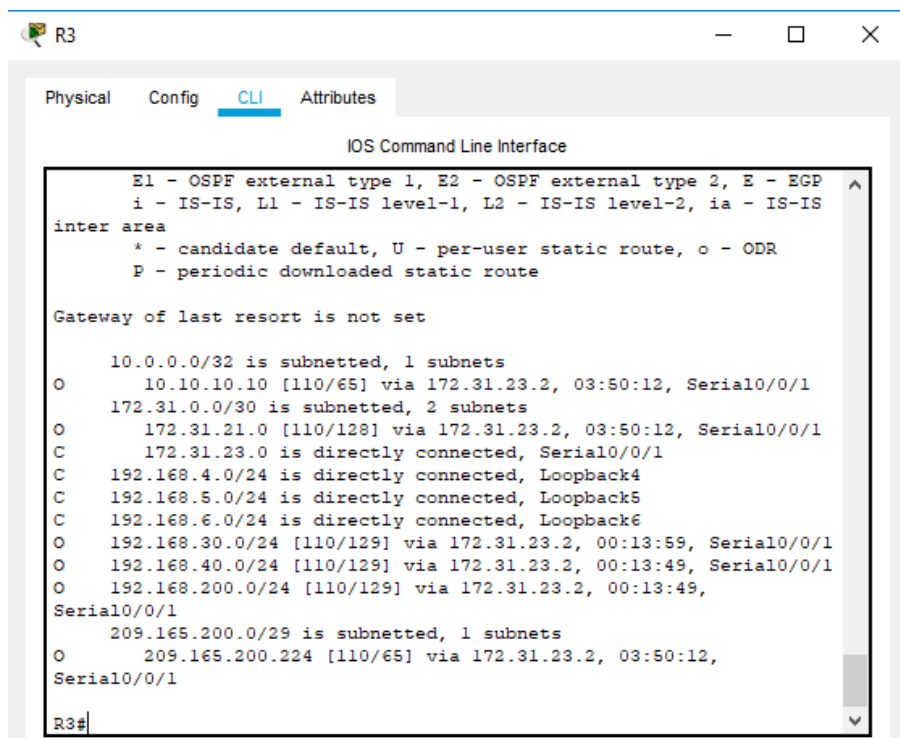
```
1.1.1.1 110 00:16:36
```

```
5.5.5.5 110 00:05:24
```

```
8.8.8.8 110 00:08:25
```

```
Distance: (default is 110)
```

ROUTER 3



```
R3
Physical Config CLI Attributes
IOS Command Line Interface
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/32 is subnetted, 1 subnets
O 10.10.10.10 [110/65] via 172.31.23.2, 03:50:12, Serial0/0/1
172.31.0.0/30 is subnetted, 2 subnets
O 172.31.21.0 [110/128] via 172.31.23.2, 03:50:12, Serial0/0/1
C 172.31.23.0 is directly connected, Serial0/0/1
C 192.168.4.0/24 is directly connected, Loopback4
C 192.168.5.0/24 is directly connected, Loopback5
C 192.168.6.0/24 is directly connected, Loopback6
O 192.168.30.0/24 [110/129] via 172.31.23.2, 00:13:59, Serial0/0/1
O 192.168.40.0/24 [110/129] via 172.31.23.2, 00:13:49, Serial0/0/1
O 192.168.200.0/24 [110/129] via 172.31.23.2, 00:13:49,
Serial0/0/1
209.165.200.0/29 is subnetted, 1 subnets
O 209.165.200.224 [110/65] via 172.31.23.2, 03:50:12,
Serial0/0/1
R3#
```


R3#show ip ospf int

```
Serial0/0/1 is up, line protocol is up
  Internet address is 172.31.23.1/30, Area 0
  Process ID 1, Router ID 8.8.8.8, Network Type POINT-TO-POINT, Cost:
64
  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 00:00:06
  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# show ip ospf neig

Neighbor ID	Pri	State	Dead Time	Address
Interface				
5.5.5.5	0	FULL/ -	00:00:38	172.31.23.2
Serial0/0/1				

R3#

R3#show ip protocols

```
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 8.8.8.8
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
    192.168.4.0 0.0.0.255 area 0
    192.168.5.0 0.0.0.255 area 0
    192.168.6.0 0.0.0.255 area 0
  Passive Interface(s):
    FastEthernet0/0
    FastEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110           00:19:46
    5.5.5.5          110           00:08:34
    8.8.8.8          110           00:11:35
  Distance: (default is 110)
```

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

S1

Nota: Se creo la vlan 999 BlackHole para seguridad, se agregan a ella todos los puertos que no se utilizan

Creación de Vlan

```
S1(config)#vlan 30
S1(config-vlan)#name ADMINISTRACION
S1(config-vlan)#exit
S1(config)#vlan 40
S1(config-vlan)#name MERCADEO
S1(config-vlan)#vlan 200
S1(config-vlan)#name MANTENIMIENTO
S1(config-vlan)#END
S1(config)#int vlan 30
S1(config-if)#
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shut
```

Puertos de Acceso

```
S1(config)#int f0/1
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#
S1(config-if)#exit
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#
S1(config)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#
S1(config-if)#exit
```

Creación de Vlan para Seguridad

```
S1(config)#vlan 999
S1(config-vlan)#name BLACKHOLE
```

Puertos de Acceso

```
S1(config)#int range f0/4-23
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 999
S1(config-if-range)#exit
S1(config)#int f0/2
S1(config-if)#switchport access vlan 999
```

```

S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 999
S1(config)#int range g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 999
S1(config-if-range)#end
S1(config-if)#exit

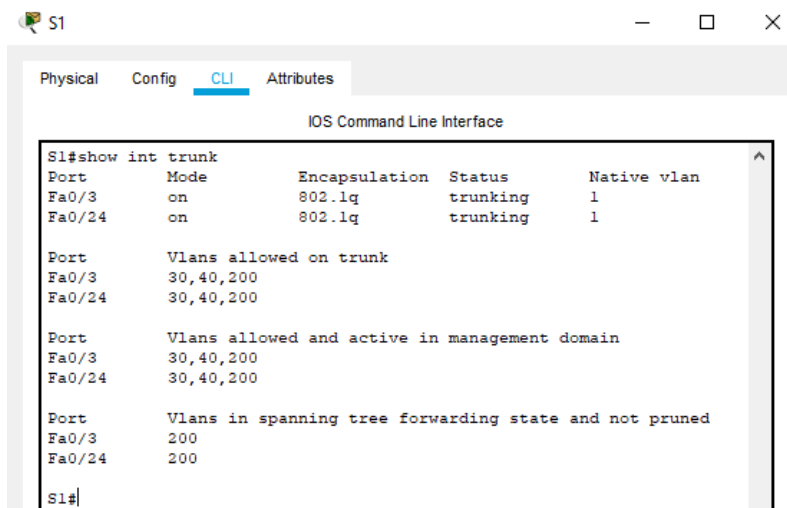
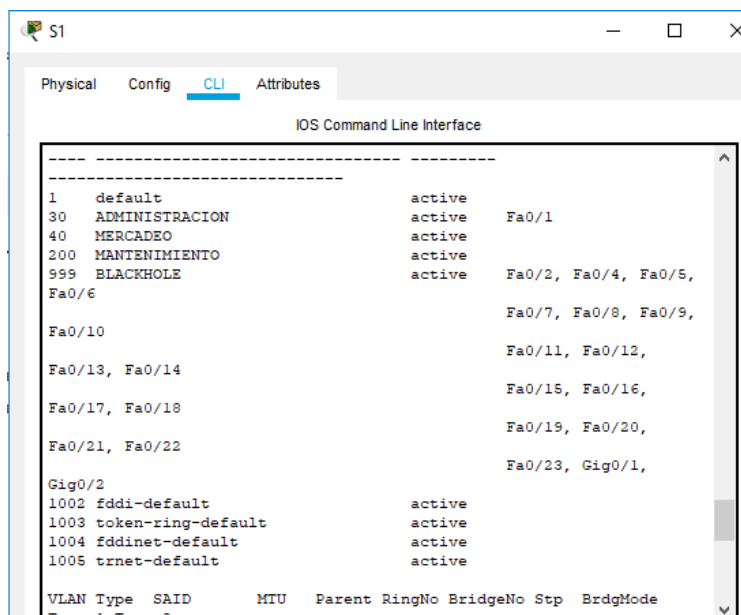
```

Creación de Seguridad

```

S1(config)#int f0/3
S1(config-if)#switchport trunk allowed vlan 30,40,200
S1(config-if)#int f0/24
S1(config-if)#switchport trunk allowed vlan 30,40,200
S1(config-if)#end

```



5.En el Switch 3 deshabilitar DNS lookup

S3

```
Switch(config)#hostname S3
```

Deshabilitar DNS Lookup

```
S3(config)#no ip domain-lookup
```

```
S3(config)#
```

```
S3(config)#service password-encryption
```

```
S3(config)#
```

```
S3(config)#enable secret cisco
```

```
S3(config)#
```

```
S3(config)#line console 0
```

```
S3(config-line)#password cisco
```

```
S3(config-line)#logging synchronous
```

```
S3(config-line)#login
```

```
S3(config-line)#exit
```

```
S3(config)#
```

```
S3(config)#line vty 0 15
```

```
S3(config-line)#password cisco
```

```
S3(config-line)#login
```

```
S3(config-line)#exit
```

```
S3(config)#
```

```
S3(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO AUTORIZADO  
&
```

Creacion de Vlan

```
S3(config)# vlan 40
```

```
S3(config-vlan)#name MERCADEO
```

```
S3(config)#vlan 30
```

```
S3(config-vlan)#name ADMINISTRACION
```

```
S3(config-vlan)#vlan 200
```

```
S3(config-vlan)#name MANTENIMIENTO
```

Creación Vlan de Seguridad

```
S3(config-vlan)#vlan 999
```

```
S3(config-vlan)#name BLACKHOLE
```

Asignación de Puertos

```
S3(config)#int range f0/4-24
```

```
S3(config-if-range)#sw mode acc
```

```
S3(config-if-range)#sw acc vlan 999
```

Puertos Troncales

```
S3(config-if)#int f0/3
```

```
S3(config-if)#sw mode trunk
```

Asignación de Puertos

```
S3(config)#int f0/1
```

```
S3(config-if)#sw mode acc
```

```
S3(config-if)#sw acc vlan 40
```

```
S3(config)#int f0/2
```

```
S3(config-if)#sw mode acc
```

```
S3(config-if)#sw acc vlan 999
```

```
S3(config)#int range g0/1-2
```

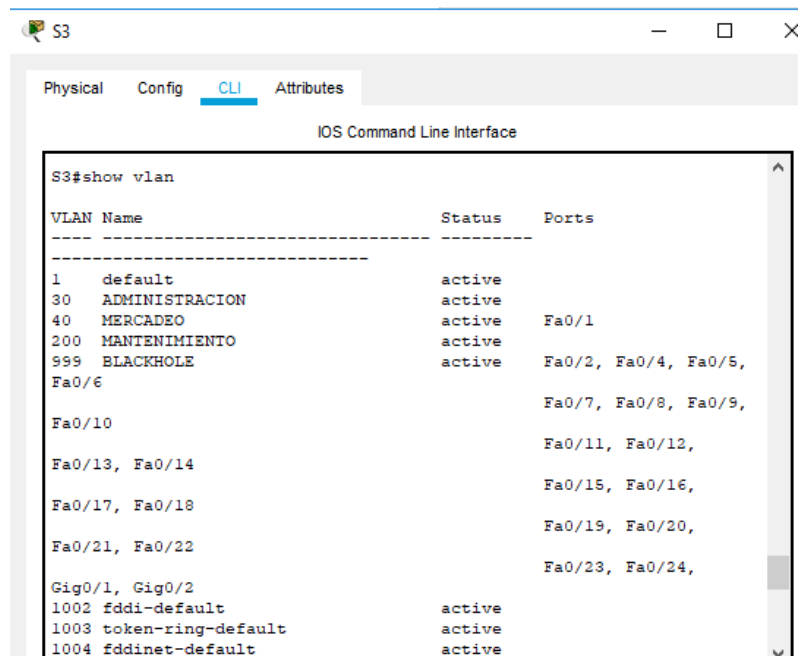
```
S3(config-if-range)#sw mode acc
```

```
S3(config-if-range)#sw acc vlan 999
```

Creación de Seguridad

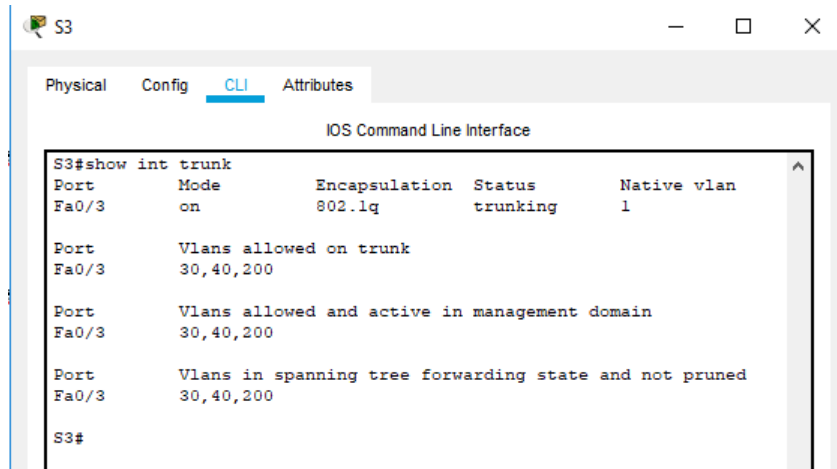
```
S3(config)#int f0/3
```

```
S3(config-if)#switchport trunk allowed vlan 30,40,200
```



```
S3#show vlan
```

VLAN Name	Status	Ports
1 default	active	
30 ADMINISTRACION	active	
40 MERCADEO	active	Fa0/1
200 MANTENIMIENTO	active	
999 BLACKHOLE	active	Fa0/2, 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, Gig0/1, Gig0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	



```
S3#show int trunk
Port      Mode      Encapsulation  Status      Native vlan
Fa0/3     on        802.1q         trunking    1

Port      Vlans allowed on trunk
Fa0/3     30,40,200

Port      Vlans allowed and active in management domain
Fa0/3     30,40,200

Port      Vlans in spanning tree forwarding state and not pruned
Fa0/3     30,40,200
S3#
```

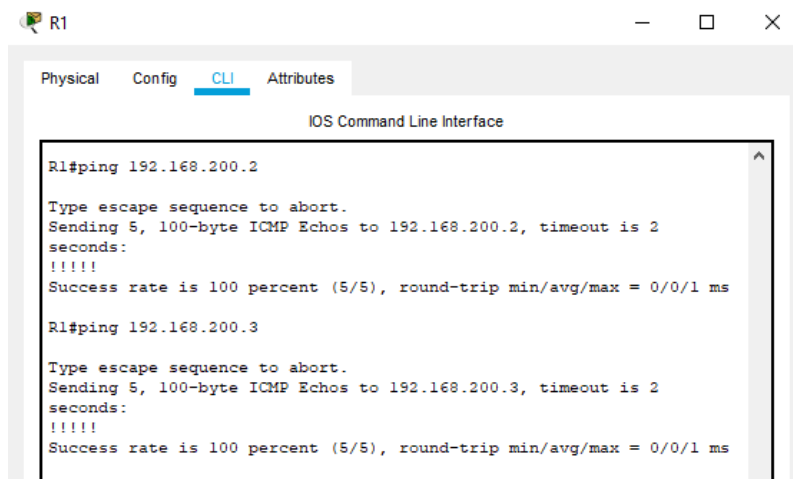
6. Asignar direcciones IP a los Switches acorde a los lineamientos.

```
S3(config)#int vlan 40
S3(config-if)#ip address 192.168.40.2 255.255.255.0
```

```
S3(config)#int vlan 200
S3(config-if)#ip address 192.168.200.3 255.255.255.0
```

```
S1(config)#int vlan 30
S1(config-if)#ip address 192.168.30.2 255.255.255.0
```

```
S1(config)#int vlan 200
S1(config-if)#ip address 192.168.200.2 255.255.255.0
```



```
R1#ping 192.168.200.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.200.2, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
R1#ping 192.168.200.3
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.200.3, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

S1

Physical Config CLI Attributes

IOS Command Line Interface

```
S1# ping 192.168.30.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.30.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

S1# ping 192.168.200.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.200.1, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

S1#
```

S3

Physical Config CLI Attributes

IOS Command Line Interface

```
S3#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 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

S3#ping 192.168.200.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.200.1, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms
```

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

R1

```
R1(config)#int f0/1
R1(config-if)#shut
R1(config-if)#int s0/0/1
R1(config-if)#shut
```

R2

```
R2(config)#int f0/1
R2(config-if)#shut
```

R3

```
R3(config)#int range f0/0-1
R3(config-if-range)#shut
R3(config-if-range)#exit
R3(config)#int s0/0/0
R3(config-if)#shut
```

S3

```
S3(config)#int g0/1
S3(config-if)#shut
S3(config-if)#int g0/2
S3(config-if)#shut
S3(config-if)#int range f0/4-24
S3(config-if-range)#shut

S3(config)#int f0/2
S3(config-if)#shut
```

S1

```
S1(config)#int f0/2
S1(config-if)#shut
S1(config-if)#int range f0/4-23
S1(config-if-range)#shut
```


R1

Configurando 802.1q

```
R1(config)#int f0/0.30
R1(config-subif)#encap dot1q 30
R1(config-subif)#ip add 192.168.30.1 255.255.255.0
R1(config-subif)#int f0/0.40
R1(config-subif)#ip add 192.168.40.1 255.255.255.0
R1(config-subif)#int f0/0.40
R1(config-subif)#encap dot1q 40
R1(config-subif)#ip add 192.168.40.1 255.255.255.0
R1(config-subif)#int f0/0.200
R1(config-subif)#encap dot1q 200
R1(config-subif)#ip add 192.168.200.1 255.255.255.0
R1(config-subif)#end
```

8.Implement DHCP and NAT for IPv4

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

Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com <u>Establecer default gateway.</u>
-----------------------------------	---

```
R1(config)#ip dhcp pool ADMINISTRACION
```

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

```
R1(dhcp-config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
```

```
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#domain-name ccna-unad.com
```

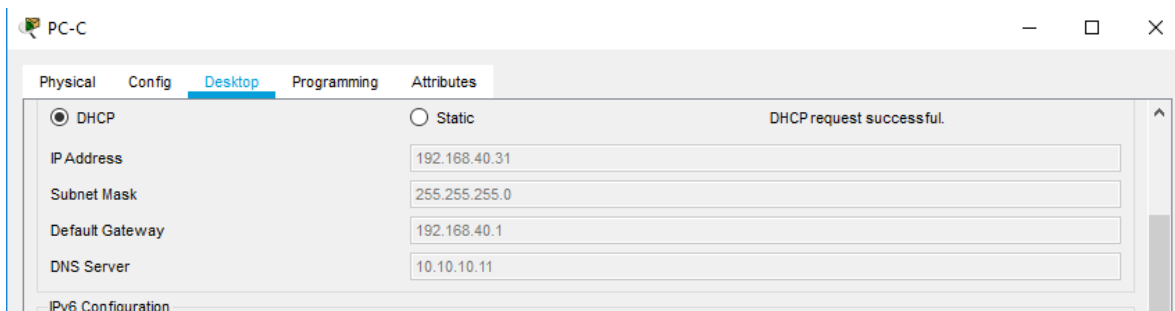
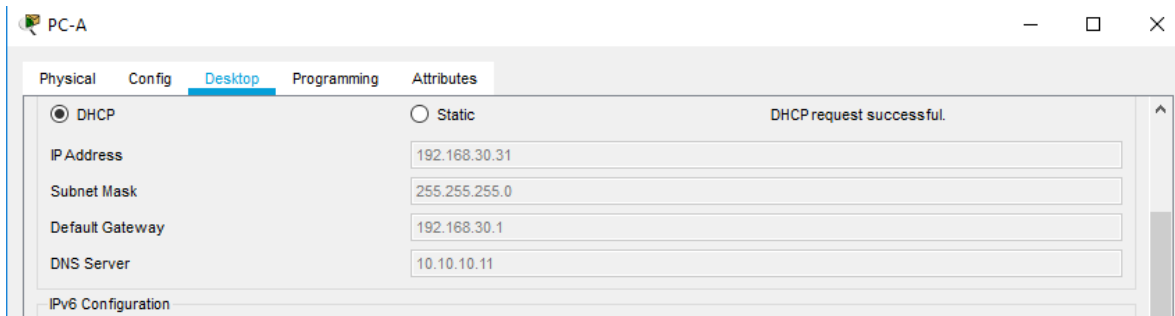
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com <u>Establecer default gateway.</u>
-----------------------------------	---

```
R1(config)#ip dhcp pool MERCADEO
```

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

```
R1(dhcp-config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#domain-name ccna-unad.com
R1(dhcp-config)#
```

Asignación de Ips por Medio DHCP en los Hots.



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

```
R2#config
```

```
Configuring from terminal, memory, or network [terminal]?
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
R2(config)#ip access-list extended ADMINISTRACION
```

```
R2(config-ext-nacl)#REMARK PERMIT LOCAL TO USE NAT
```

```
R2(config-ext-nacl)#permit ip 192.168.30.0 0.0.0.255 any
```

```
R2(config-ext-nacl)#permit ip 192.168.40.0 0.0.0.255 any
```

```
R2(config-ext-nacl)#exit
```

```
R2(config)#ip nat pool MIAMI-POOL 209.165.200.225 209.165.200.228 netmask  
255.255.255.248
```

```
R2(config)#ip nat inside source list ADMINISTRACION pool MIAMI-POOL
```

```
R2(config)#int lo0
```

```
R2(config-if)#ip nat inside
```

```
R2(config-if)#int s0/0/1
```

```
R2(config-if)#ip nat outside
```

```
R2(config-if)#
```

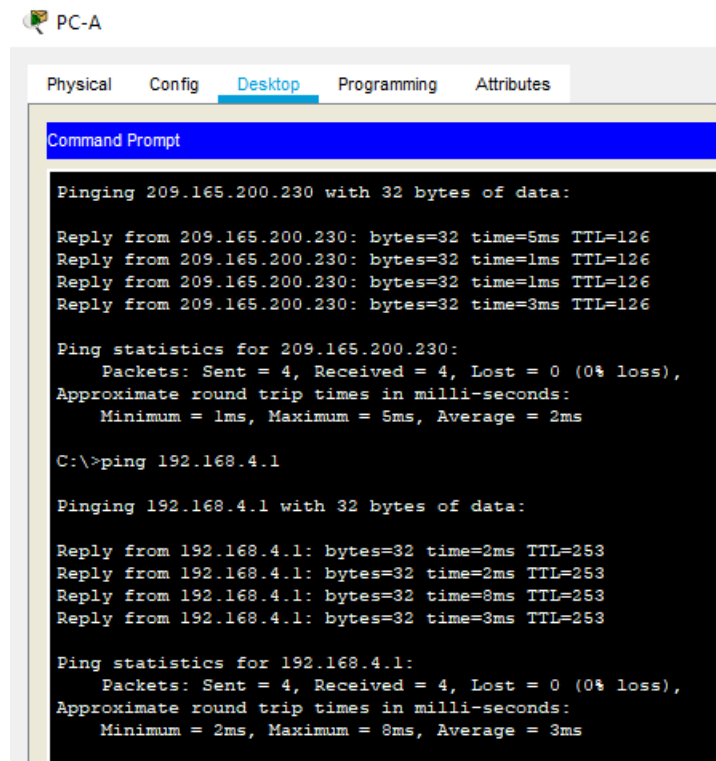
12. Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

```
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 2 deny 192.168.4.0 0.0.0.255
R2(config)#
```

13. 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.

```
R2(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.5.0 0.0.0.255
R2(config)#access-list 1 permit 192.168.6.0 0.0.0.255
R2(config)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask
255.255.255.248
```

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



The screenshot shows a Windows Command Prompt window titled "PC-A" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active. The command prompt displays the following output:

```
Command Prompt

Pinging 209.165.200.230 with 32 bytes of data:

Reply from 209.165.200.230: bytes=32 time=5ms TTL=126
Reply from 209.165.200.230: bytes=32 time=1ms TTL=126
Reply from 209.165.200.230: bytes=32 time=1ms TTL=126
Reply from 209.165.200.230: bytes=32 time=3ms TTL=126

Ping statistics for 209.165.200.230:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 5ms, Average = 2ms

C:\>ping 192.168.4.1

Pinging 192.168.4.1 with 32 bytes of data:

Reply from 192.168.4.1: bytes=32 time=2ms TTL=253
Reply from 192.168.4.1: bytes=32 time=2ms TTL=253
Reply from 192.168.4.1: bytes=32 time=8ms TTL=253
Reply from 192.168.4.1: bytes=32 time=3ms TTL=253

Ping statistics for 192.168.4.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 8ms, Average = 3ms
```

```

Physical  Config  Desktop  Programming  Attributes
Command Prompt
C:\>tracert 209.165.200.230

Tracing route to 209.165.200.230 over a maximum of 30 hops:

  1  0 ms    1 ms    0 ms    192.168.40.1
  2  1 ms    3 ms    1 ms    172.31.21.2
  3  1 ms    0 ms    2 ms    209.165.200.230

Trace complete.

C:\>tracert 209.165.200.225

Tracing route to 209.165.200.225 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.40.1
  2  0 ms    1 ms    0 ms    209.165.200.225

Trace complete.

C:\>tracert 172.31.23.1

Tracing route to 172.31.23.1 over a maximum of 30 hops:

  1  1 ms    0 ms    0 ms    192.168.40.1
  2  1 ms    1 ms    2 ms    172.31.21.2
  3  8 ms    0 ms    4 ms    172.31.23.1

Trace complete.

C:\>

```

```

Physical  Config  Desktop  Programming  Attributes
Command Prompt
C:\>ping 172.31.21.2

Pinging 172.31.21.2 with 32 bytes of data:

Reply from 172.31.21.2: bytes=32 time=2ms TTL=254
Reply from 172.31.21.2: bytes=32 time=1ms TTL=254
Reply from 172.31.21.2: bytes=32 time=6ms TTL=254
Reply from 172.31.21.2: bytes=32 time=2ms TTL=254

Ping statistics for 172.31.21.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 6ms, Average = 2ms

C:\>ping 172.31.23.2

Pinging 172.31.23.2 with 32 bytes of data:

Reply from 172.31.23.2: bytes=32 time=2ms TTL=254
Reply from 172.31.23.2: bytes=32 time=1ms TTL=254
Reply from 172.31.23.2: bytes=32 time=1ms TTL=254
Reply from 172.31.23.2: bytes=32 time=1ms TTL=254

Ping statistics for 172.31.23.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

```

Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	PC-A	INTERNET	ICMP		0.000
	Successful	PC-A	INTERNET	ICMP		0.000
	Successful	PC-A	PC-C	ICMP		0.000

Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	R2	R3	ICMP		0.000
	Successful	R3	PC-C	ICMP		0.000
	Successful	R3	PC-A	ICMP		0.000

Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	PC-A	R1	ICMP		0.000
	Successful	PC-C	R1	ICMP		0.000
	Successful	R1	R2	ICMP		0.000

Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	PC-C	INTERNET	ICMP		0.000
	Successful	PC-A	INTERNET	ICMP		0.000
	Successful	R3	INTERNET	ICMP		0.000

Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	INTERNET	PC-A	ICMP		0.000
	Successful	INTERNET	PC-C	ICMP		0.000
	Successful	INTERNET	R3	ICMP		0.000

Fire	Last Status	Source	Destination	Type	Color	Time(sec)
	Successful	INTERNET	R1	ICMP		0.000
	Successful	INTERNET	R2	ICMP		0.000
	Successful	INTERNET	R3	ICMP		0.000

INTERNET

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.40.31

Pinging 192.168.40.31 with 32 bytes of data:

Reply from 192.168.40.31: bytes=32 time=1ms TTL=126
Reply from 192.168.40.31: bytes=32 time=5ms TTL=126
Reply from 192.168.40.31: bytes=32 time=5ms TTL=126
Reply from 192.168.40.31: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.40.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 5ms, Average = 3ms

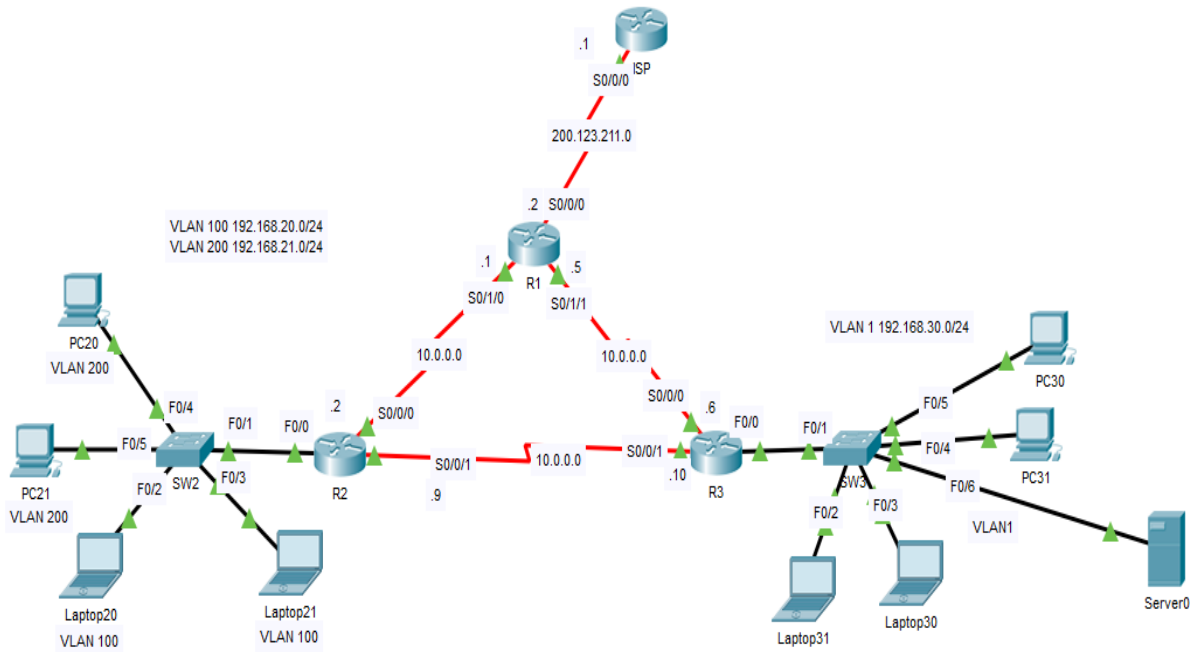
C:\>ping 192.168.30.31

Pinging 192.168.30.31 with 32 bytes of data:

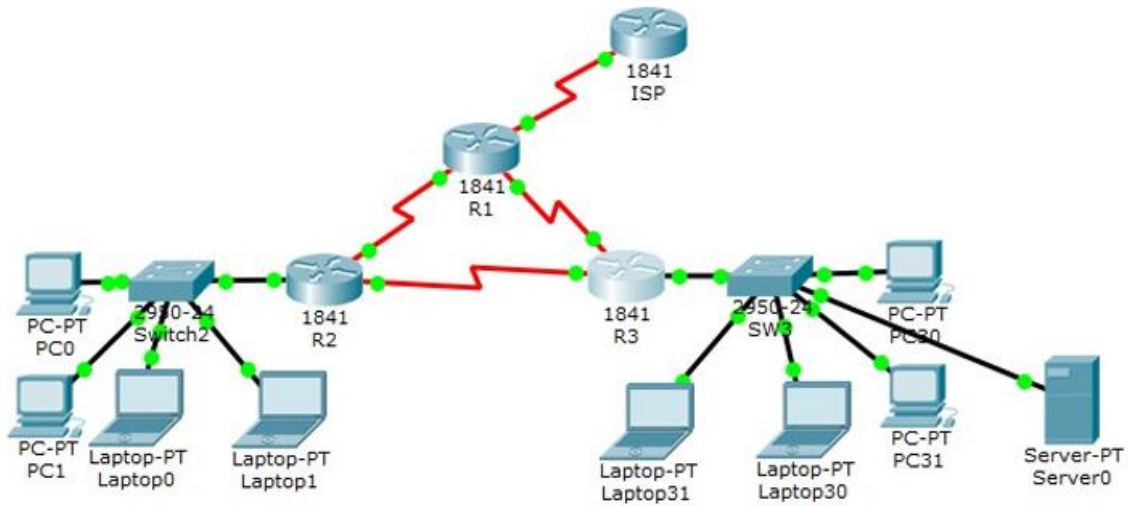
Reply from 192.168.30.31: bytes=32 time=9ms TTL=126
Reply from 192.168.30.31: bytes=32 time=3ms TTL=126
Reply from 192.168.30.31: bytes=32 time=10ms TTL=126
Reply from 192.168.30.31: bytes=32 time=3ms TTL=126

Ping statistics for 192.168.30.31:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 10ms, Average = 6ms
```

ESCENARIO 1



Escenario 1



El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
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

Situation

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.

R1

```
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#
R1(config)#service password-encryption
R1(config)#
R1(config)#enable secret cisco
R1(config)#
R1(config)#line console 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#
R1(config)#line vty 0 15
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#
R1(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO AUTORIZADO
&
R1(config)#int s0/0/0
R1(config-if)#ip add 200.123.211.2 255.255.255.0
```



```
R1(config-if)#no shut
R1(config-if)#
R1(config-if)#in
R1(config-if)#int s0/1/0
R1(config-if)#ip add 10.0.0.1 255.255.255.252
R1(config-if)#no shut
R1(config-if)#int s0/1/1
R1(config-if)#ip add 10.0.0.5 255.255.255.252
R1(config-if)#no shut
```

R2

```
Router(config)#no ip domain-lookup
Router(config)#
Router(config)#service password-encryption
Router(config)#
Router(config)#enable secret cisco
Router(config)#
Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#
Router(config)#line vty 0 15
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#
Router(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO
AUTORIZADO &
Router(config)#hostname R2
R2(config)#int f0/0
R2(config-if)#no shut
R2(config-if)#int s0/0/0
R2(config-if)#ip add 10.0.0.2 255.255.255.252
R2(config-if)#no shut
R2(config-if)#int s0/0/1
R2(config-if)#ip add 10.0.0.9 255.255.255.252
R2(config-if)#no shut
```

Configurando 802.1q

```
R2(config-if)#int f0/0.100
R2(config-subif)#encap dot1q 100
R2(config-subif)#ip add 192.168.20.1 255.255.255.0
.R2(config-subif)#int f0/0.200
R2(config-subif)#
```

```
R2(config-subif)#encap dot1q 200
R2(config-subif)#ip add 192.168.21.1 255.255.255.0
```

R3

```
R3(config)#no ip domain-lookup
R3(config)#
R3(config)#service password-encryption
R3(config)#
R3(config)#enable secret cisco
R3(config)#
R3(config)#line console 0
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#
R3(config)#line vty 0 15
R3(config-line)#password cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#
R3(config)#banner motd & PROHIBIDO INGRESO DE PERSONAL NO AUTORIZADO
&
R3(config)#int s0/0/0
R3(config-if)#ip add 10.0.0.6 255.255.255.252
R3(config-if)#no shut
R3(config-if)#int s0/0/1
R3(config-if)#ip add 10.0.0.10 255.255.255.252
R3(config-if)#no shut
```

Descripción de las actividades

2) SW VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla

Creacion de Vlan

```
SW2(config)#vlan 100
SW2(config-vlan)#name LAPTOPS
SW2(config-vlan)#vlan 200
SW2(config-vlan)#name DESKTOPS
SW2(config-vlan)#in vlan 100
SW2(config-if)#
```

Asignación de Puertos

```
SW2(config-if)#int range f0/2-3
SW2(config-if-range)#sw mode acc
```

```
SW2(config-if-range)#sw acc vlan 100
SW2(config-if-range)#
SW2(config-if-range)#exit
SW2(config)#int range f0/4-5
SW2(config-if-range)#sw mode acc
SW2(config-if-range)#sw acc vlan 200
SW2(config-if-range)#int vlan 200
SW2(config-if)#
```

3) Los puertos de red que no se utilizan se deben deshabilitar.

ISP

Deshabilitando Puertos

```
ISP(config)#int range f0/0-1
ISP(config-if-range)#shut
ISP(config-if-range)#int s0/0/1
ISP(config-if)#shut
```

R1

Deshabilitando Puertos

```
R1(config)#int range f0/0-1
R1(config-if-range)#shut
R1(config-if-range)#int s0/0/1
R1(config-if)#shut
R1(config-if)#
```

R2

Desabilitando Puertos

```
R2(config)#int f0/1
R2(config-if)#shut
R2(config-if)#int s0/1/0
R2(config-if)#shut
R2(config-if)#int s0/1/1
R2(config-if)#shut
```

R3

Deshabilitando Puertos

```
R3(config)#int f0/1
R3(config-if)#shut
R3(config-if)#int s0/1/0
R3(config-if)#shut
R3(config-if)#int s0/1/1
R3(config-if)#shut
R3(config-if)#
```

SW2

Deshabilitando Puertos

```
SW2(config)#int range f0/6-24  
SW2(config-if-range)#shut
```

SW3

Deshabilitando Puertos

```
SW3(config)#int range f0/7-24  
SW3(config-if-range)#shut
```

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

Configuración DHCP para Vlan 100

```
R2(config)#ip dhcp pool vlan100  
ip dhcp excluded-address 192.168.20.1 192.168.20.19  
network 192.168.20.0 255.255.255.0  
default-router 192.168.20.1  
R2(dhcp-config)#dns-server 8.8.8.8  
R2(dhcp-config)#domain-name ccna-unad.com  
R2(dhcp-config)#exit
```

Configuración DHCP para Vlan 200

```
R2(config)#ip dhcp pool vlan200  
R2(dhcp-config)#network 192.168.21.0 255.255.255.0  
R2(dhcp-config)#ip dhcp excluded-address 192.168.21.1 192.168.21.19  
R2(dhcp-config)#default-router 192.168.21.1  
R2(dhcp-config)#dns-server 8.8.8.8  
R2(dhcp-config)#domain-name ccna-unad.com  
R2(dhcp-config)#exit
```

SW2

Puertos Troncales

```
Sw2(config)#int f0/1  
Sw2(config-if)#sw mode trunk
```

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

Obteniendo Ips por DHCP en los Host

PC20

Physical	Config	Desktop	Programming	Attributes
<input checked="" type="radio"/> DHCP				<input type="radio"/> Static DHCP request successful.
IP Address				192.168.21.20
Subnet Mask				255.255.255.0
Default Gateway				192.168.21.1
DNS Server				8.8.8.8

PC21

Physical	Config	Desktop	Programming	Attributes
<input checked="" type="radio"/> DHCP				<input type="radio"/> Static DHCP request successful.
IP Address				192.168.21.21
Subnet Mask				255.255.255.0
Default Gateway				192.168.21.1
DNS Server				8.8.8.8

Laptop21

Physical	Config	Desktop	Programming	Attributes
<input checked="" type="radio"/> DHCP				<input type="radio"/> Static DHCP request successful.
IP Address				192.168.20.21
Subnet Mask				255.255.255.0
Default Gateway				192.168.20.1
DNS Server				8.8.8.8

Laptop20

Physical	Config	Desktop	Programming	Attributes
<input checked="" type="radio"/> DHCP				<input type="radio"/> Static DHCP request successful.
IP Address				192.168.20.20
Subnet Mask				255.255.255.0
Default Gateway				192.168.20.1
DNS Server				8.8.8.8

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

R3

Configuración Dual-Stack

```
R3(config)#int f0/0.2
R3(config-subif)# encapsulation dot1Q 2
R3(config-subif)#ipv6 add 2001:DB8:130::9C0:80F:301/64

R3(config-subif)#int f0/0.1
R3(config-subif)#
R3(config-subif)#encap dot1q 1
R3(config-subif)#ip add 192.168.30.1 255.255.255.0
R3(config-subif)#

R3(config)#int f0/0
R3(config-subif)#no shut
```

7) 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.

R3

Configuración DHCP

```
R3(config)#ip dhcp pool vlan1
R3(dhcp-config)#ip dhcp excluded-address 192.168.30.1 192.168.30.19
R3(dhcp-config)#network 192.168.30.0 255.255.255.0
R3(dhcp-config)#default-router 192.168.30.1
R3(dhcp-config)#dns-server 8.8.8.8
R3(dhcp-config)#domain-name ccna-unad.com
R3(dhcp-config)#end
```

Configuración DHCP6

```
R3(config)#ipv6 dhcp pool cisco
R3(config-dhcpv6)#address prefix 2001:db8:acad:a::/64
R3(config-dhcpv6)#domain-name ccna-unad.com
R3(config-dhcpv6)#end
R3(config)#int f0/0
R3(config-if)#ipv6 nd managed-config-flagR3#
```

SW3

Puertos Troncales

Sw3(config)#int f0/1

Sw3(config-if)#sw mode trunk

Obteniendo Ips por DHCP en los Host

PC30

Physical Config **Desktop** Programming Attributes

DHCP Static DHCP request successful.

IP Address	192.168.30.34
Subnet Mask	255.255.255.0
Default Gateway	192.168.30.1
DNS Server	8.8.8.8

IPv6 Configuration

Laptop31

Physical Config **Desktop** Programming Attributes

DHCP Static DHCP request successful.

IP Address	192.168.30.30
Subnet Mask	255.255.255.0
Default Gateway	192.168.30.1
DNS Server	8.8.8.8

IPv6 Configuration

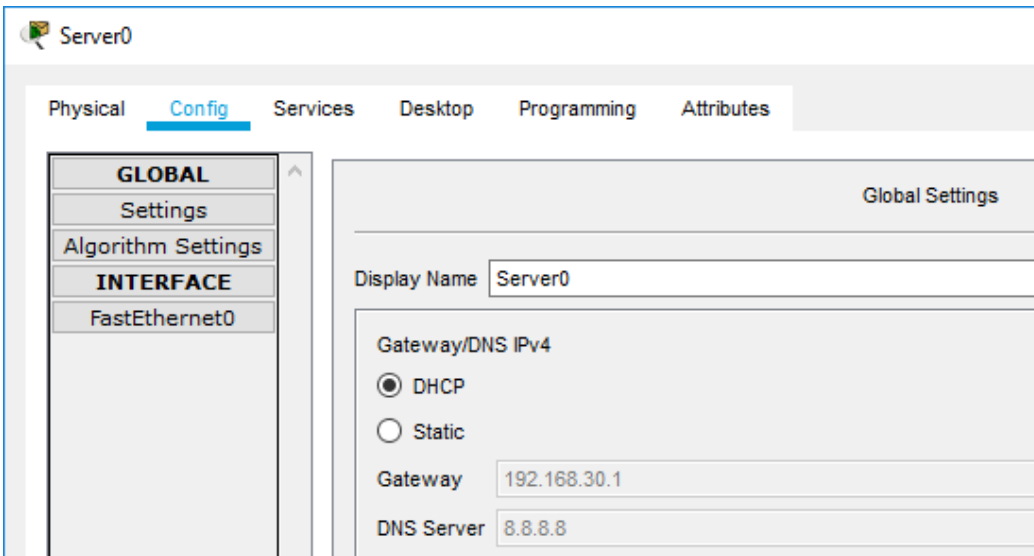
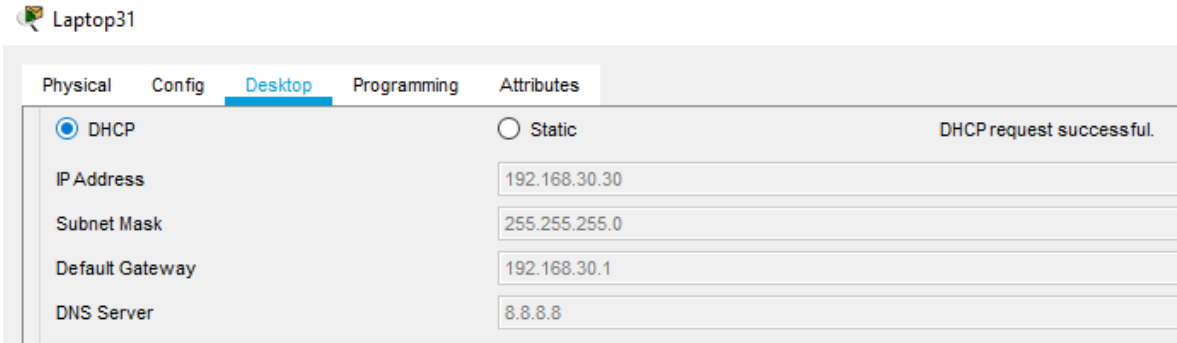
Laptop30

Physical Config **Desktop** Programming Attributes

DHCP Static DHCP request successful.

IP Address	192.168.30.31
Subnet Mask	255.255.255.0
Default Gateway	192.168.30.1
DNS Server	8.8.8.8

IPv6 Configuration



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

Configuración de Ruta Estática

```
R1(config)#ip route 0.0.0.0 0.0.0.0 200.123.211.1
```

```
R1(config)#end
```

```
R1(config)#router rip
```

```
R1(config-router)#version 2
```

```
R1(config-router)#redistribute static
```

Configuración ruta estática en ISP

```
ISP(config)#ip route 200.123.212.0 255.255.255.248 200.123.211.2
```


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

R1

Configurando RIP V2

```
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 10.0.0.1
R1(config-router)#network 10.0.0.5
R1(config-router)#redistribute static
R1(config-router)#network 200.123.211.2
R1(config-router)#no auto-summary
```

R2

Configurando RIP V2

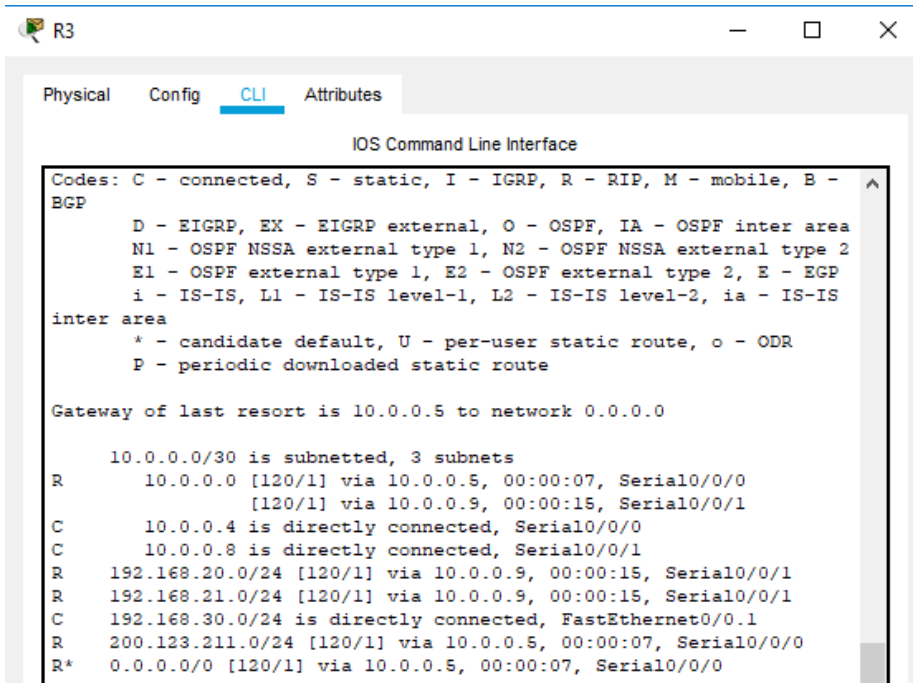
```
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#network 10.0.0.2
R2(config-router)#network 10.0.0.9
R2(config-router)#network 192.168.20.1
R2(config-router)#network 192.168.21.1
R2(config-router)#no auto-summary
```

R3

Configurando RIP V2

```
R3(config)#router rip
R3(config-router)#version 2
R3(config-router)#network 10.0.0.6
R3(config-router)#network 10.0.0.10
R3(config-router)#network 192.168.30.1
R3(config-router)#no auto-summary
```

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

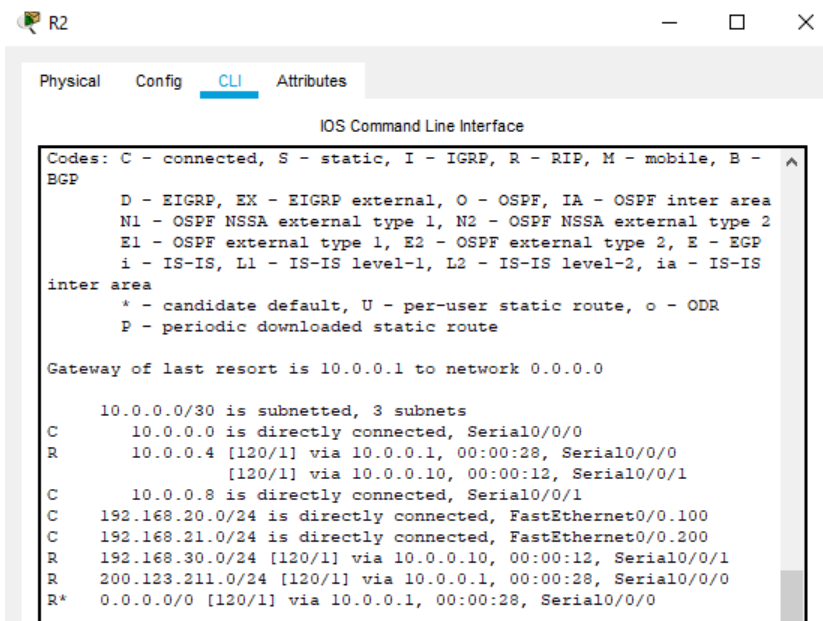


The screenshot shows the CLI of router R3. The routing table is displayed with the following entries:

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
       inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 10.0.0.5 to network 0.0.0.0

   10.0.0.0/30 is subnetted, 3 subnets
R       10.0.0.0 [120/1] via 10.0.0.5, 00:00:07, Serial0/0/0
         [120/1] via 10.0.0.9, 00:00:15, Serial0/0/1
C       10.0.0.4 is directly connected, Serial0/0/0
C       10.0.0.8 is directly connected, Serial0/0/1
R     192.168.20.0/24 [120/1] via 10.0.0.9, 00:00:15, Serial0/0/1
R     192.168.21.0/24 [120/1] via 10.0.0.9, 00:00:15, Serial0/0/1
C     192.168.30.0/24 is directly connected, FastEthernet0/0.1
R     200.123.211.0/24 [120/1] via 10.0.0.5, 00:00:07, Serial0/0/0
R*    0.0.0.0/0 [120/1] via 10.0.0.5, 00:00:07, Serial0/0/0
```



The screenshot shows the CLI of router R2. The routing table is displayed with the following entries:

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
       inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 10.0.0.1 to network 0.0.0.0

   10.0.0.0/30 is subnetted, 3 subnets
C       10.0.0.0 is directly connected, Serial0/0/0
R       10.0.0.4 [120/1] via 10.0.0.1, 00:00:28, Serial0/0/0
         [120/1] via 10.0.0.10, 00:00:12, Serial0/0/1
C       10.0.0.8 is directly connected, Serial0/0/1
C     192.168.20.0/24 is directly connected, FastEthernet0/0.100
C     192.168.21.0/24 is directly connected, FastEthernet0/0.200
R     192.168.30.0/24 [120/1] via 10.0.0.10, 00:00:12, Serial0/0/1
R     200.123.211.0/24 [120/1] via 10.0.0.1, 00:00:28, Serial0/0/0
R*    0.0.0.0/0 [120/1] via 10.0.0.1, 00:00:28, Serial0/0/0
```

```
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS
inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 0.0.0.0 to network 0.0.0.0

     10.0.0.0/30 is subnetted, 3 subnets
C       10.0.0.0 is directly connected, Serial0/1/0
C       10.0.0.4 is directly connected, Serial0/1/1
R       10.0.0.8 [120/1] via 10.0.0.2, 00:00:08, Serial0/1/0
         [120/1] via 10.0.0.6, 00:00:22, Serial0/1/1
R       192.168.20.0/24 [120/1] via 10.0.0.2, 00:00:08, Serial0/1/0
R       192.168.21.0/24 [120/1] via 10.0.0.2, 00:00:08, Serial0/1/0
R       192.168.30.0/24 [120/1] via 10.0.0.6, 00:00:22, Serial0/1/1
C       200.123.211.0/24 is directly connected, Serial0/0/0
S*     0.0.0.0/0 is directly connected, Serial0/0/0
```

11) 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(config)#access-list 1 permit 192.168.20.0 0.0.0.255
```

```
R1(config)#access-list 1 permit 192.168.30.0 0.0.0.255
```

```
R1(config)#access-list 1 permit 192.168.21.0 0.0.0.255
```

```
R1(config)#ip nat pool INSIDE-DEVS 200.123.212.1 200.123.212.6 netmask
255.255.255.248
```

12) Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP

PC20

```
Physical  Config  Desktop  Programming  Attributes
Command Prompt

Pinging 200.123.211.1 with 32 bytes of data:

Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=9ms TTL=253
Reply from 200.123.211.1: bytes=32 time=10ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253

Ping statistics for 200.123.211.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 10ms, Average = 5ms

C:\>ping 200.123.211.2

Pinging 200.123.211.2 with 32 bytes of data:

Reply from 200.123.211.2: bytes=32 time=6ms TTL=254
Reply from 200.123.211.2: bytes=32 time=1ms TTL=254
Reply from 200.123.211.2: bytes=32 time=2ms TTL=254
Reply from 200.123.211.2: bytes=32 time=1ms TTL=254

Ping statistics for 200.123.211.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 6ms, Average = 2ms
```

PC21

```
Physical  Config  Desktop  Programming  Attributes
Command Prompt

Pinging 200.123.211.1 with 32 bytes of data:

Reply from 200.123.211.1: bytes=32 time=3ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=7ms TTL=253

Ping statistics for 200.123.211.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 7ms, Average = 3ms

C:\>ping 10.0.0.1

Pinging 10.0.0.1 with 32 bytes of data:

Reply from 10.0.0.1: bytes=32 time=7ms TTL=254
Reply from 10.0.0.1: bytes=32 time=4ms TTL=254
Reply from 10.0.0.1: bytes=32 time=1ms TTL=254
Reply from 10.0.0.1: bytes=32 time=1ms TTL=254

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 7ms, Average = 3ms

C:\>
```

```
Laptop20
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 200.123.211.1

Pinging 200.123.211.1 with 32 bytes of data:

Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253
Reply from 200.123.211.1: bytes=32 time=2ms TTL=253

Ping statistics for 200.123.211.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 2ms, Average = 2ms

C:\>ping 200.123.211.2

Pinging 200.123.211.2 with 32 bytes of data:

Reply from 200.123.211.2: bytes=32 time=1ms TTL=254
Reply from 200.123.211.2: bytes=32 time=1ms TTL=254
Reply from 200.123.211.2: bytes=32 time=1ms TTL=254
Reply from 200.123.211.2: bytes=32 time=1ms TTL=254

Ping statistics for 200.123.211.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 1ms, Average = 1ms

C:\>
```

```
Laptop21
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.30.24

Pinging 192.168.30.24 with 32 bytes of data:

Reply from 192.168.30.24: bytes=32 time=1ms TTL=126
Reply from 192.168.30.24: bytes=32 time=4ms TTL=126
Reply from 192.168.30.24: bytes=32 time=2ms TTL=126
Reply from 192.168.30.24: bytes=32 time=2ms TTL=126

Ping statistics for 192.168.30.24:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 4ms, Average = 2ms

C:\>ping 192.168.30.23

Pinging 192.168.30.23 with 32 bytes of data:

Reply from 192.168.30.23: bytes=32 time=1ms TTL=126
Reply from 192.168.30.23: bytes=32 time=7ms TTL=126
Reply from 192.168.30.23: bytes=32 time=1ms TTL=126
Reply from 192.168.30.23: bytes=32 time=6ms TTL=126

Ping statistics for 192.168.30.23:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 7ms, Average = 3ms

C:\>
```

Physical Config Services **Desktop** Programming Attributes

Command Prompt

```
Packet Tracer SERVER Command Line 1.0
C:\>tracer 200.123.211.1
Invalid Command.

C:\>tracert 200.123.211.1

Tracing route to 200.123.211.1 over a maximum of 30 hops:

  1  1 ms    0 ms    1 ms    192.168.30.1
  2  0 ms    0 ms    2 ms    10.0.0.5
  3  1 ms    0 ms    1 ms    200.123.211.1

Trace complete.

C:\>tracert 192.168.21.20

Tracing route to 192.168.21.20 over a maximum of 30 hops:

  1  0 ms    1 ms    0 ms    192.168.30.1
  2  0 ms    1 ms    0 ms    10.0.0.9
  3  0 ms    0 ms    0 ms    192.168.21.20

Trace complete.

C:\>
```

Physical Config **Desktop** Programming Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>tracert 200.123.211.1

Tracing route to 200.123.211.1 over a maximum of 30 hops:

  1  1 ms    1 ms    1 ms    192.168.30.1
  2  0 ms    1 ms    0 ms    10.0.0.5
  3  0 ms    1 ms    1 ms    200.123.211.1

Trace complete.

C:\>tracert 10.0.0.1

Tracing route to 10.0.0.1 over a maximum of 30 hops:

  1  0 ms    0 ms    0 ms    192.168.30.1
  2  2 ms    0 ms    1 ms    10.0.0.9

Trace complete.

C:\>
```

CORRECCION SUGERIDA

Simplemente faltaba el click para elegir el servicio dhcp, ya se eligio y genero rápidamente la ip por dhcp en la lapton 31

Laptop31

Physical Config **Desktop** Programming Attributes

DHCP Static

IP Address: 192.168.30.20

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.30.1

DNS Server: 8.8.8.8

Server0

Physical Config Services **Desktop** Programming Attributes

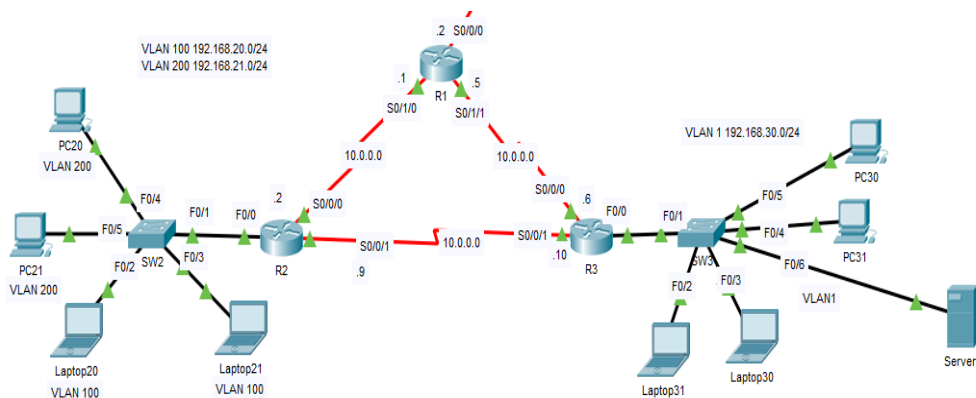
DHCP Static

IP Address: 192.168.30.21

Subnet Mask: 255.255.255.0

Default Gateway: 192.168.30.1





DNS Server: 8.8.8.8



0:03:20 [Simulation Controls]

Realtime Simulation

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num
●	Successful	Laptop31	Server0	ICMP	Green	0.000	N	0
●	Successful	Server0	Laptop31	ICMP	Red	0.000	N	1

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num
	Successful	Laptop31	Server0	ICMP		0.000	N	0
	Successful	Server0	Laptop31	ICMP		0.000	N	1

Laptop31

Physical Config **Desktop** Programming Attributes

Command Prompt

```

Packet Tracer PC Command Line 1.0
C:\>ping 192.168.30.21

Pinging 192.168.30.21 with 32 bytes of data:

Reply from 192.168.30.21: bytes=32 time=1ms TTL=128
Reply from 192.168.30.21: bytes=32 time<1ms TTL=128
Reply from 192.168.30.21: bytes=32 time<1ms TTL=128
Reply from 192.168.30.21: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.30.21:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>tracert 192.168.30.21

Tracing route to 192.168.30.21 over a maximum of 30 hops:

  1  0 ms      0 ms      0 ms      192.168.30.21

Trace complete.

C:\>

```


CONCLUSIONES

Se identifica cada uno de los componentes físicos presentes en el desarrollo de la actividad, así como la finalidad de las conexiones y sus protocolos de enrutamiento, con el fin de dar inicio a la aplicación de cada uno de las habilidades prácticas obtenidas en el diplomado Cisco CCNA

Se pusieron en práctica los protocolos de conexión solicitados en la actividad, como los fueron OFPS y RIP V2 los cuales pudimos identificar y aplicar la conceptualización teórica adquirida en el desarrollo del curso, así como las características de configuración permitidas por cada uno de los equipos en un ambiente virtual que se simula de la mejor manera a uno real de laboratorio.

Mediante la presentación de un trabajo escrito se establece y desarrolla cada uno de las solicitudes inertes en la guía de actividades prácticas del curso, con el fin de aplicar el óptimo manejo de los equipos y recursos tecnológicos solicitados.

BIBLIOGRAFÍA

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Capítulo 2 configuración y conceptos básicos de switch

Capítulo 8 ospf de área única

Capítulo 10 dhcp

<https://static-course-assets.s3.amazonaws.com/RSE503/es/index.html#3.2>

Tutoriales Packet Tracer

José Pablo Ullate e, Comandos Básicos, ARRANQUE DEL ROUTER

<https://docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxt>

b2QyY2NuYXxneDo3YWJkZGQ4ZGZmZTdmNDY0 NEWFLY, REDES CISCO Y PACKET TRACER, VIDEOS

<https://youtu.be/la2arQe6Kkg> EL ROUTER DIRECCIONAMIENTO IP

<https://youtu.be/rhUTmcMOtNw> EL ROUTER PUERTA DE ENLACES

<https://youtu.be/GWAvu7mC1ZM>