UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD

DIPLOMADO DE PROFUNDIZACIÓN CISCO CCNA

EVALUACIÓN – PRUEBA DE HABILIDADES PRÁCTICAS CCNA

PRESENTADO POR:

HENRY JHOAN

TORRES VILLARREAL

GRUPO:

203092_16

TUTOR

GERARDO GRANADOS

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TABLA DE CONTENIDO

INTRODUCCIÓN

El presente documento contiene las actividades prácticas propuestas en la fase final del diplomado CCNA 1 y CCNA 2 cursado a lo largo del periodo, este recopila los conocimientos adquiridos en cada una de las fases desarrolladas. La Certificación Cisco es un plan de capacitación en tecnología de redes informáticas que la empresa Cisco ofrece. Se divide en tres niveles, de menor a mayor complejidad: Cisco Certified Network Associate, Cisco Certified Network Professional y Cisco Certified Internetwork Expert, más conocidos por sus siglas: CCNA, CCNP y CCIE.

El desarrollo del escenario propuesto se hizo bajo el programa Packet Tracer, en el cual se llevó a cabo cada una de las tareas propuestas, con el objetivo de demostrar las habilidades adquiridas y la aplicabilidad que tiene en el mundo laboral, recordando siempre su importancia en la ingeniería de sistemas y carreras afines.
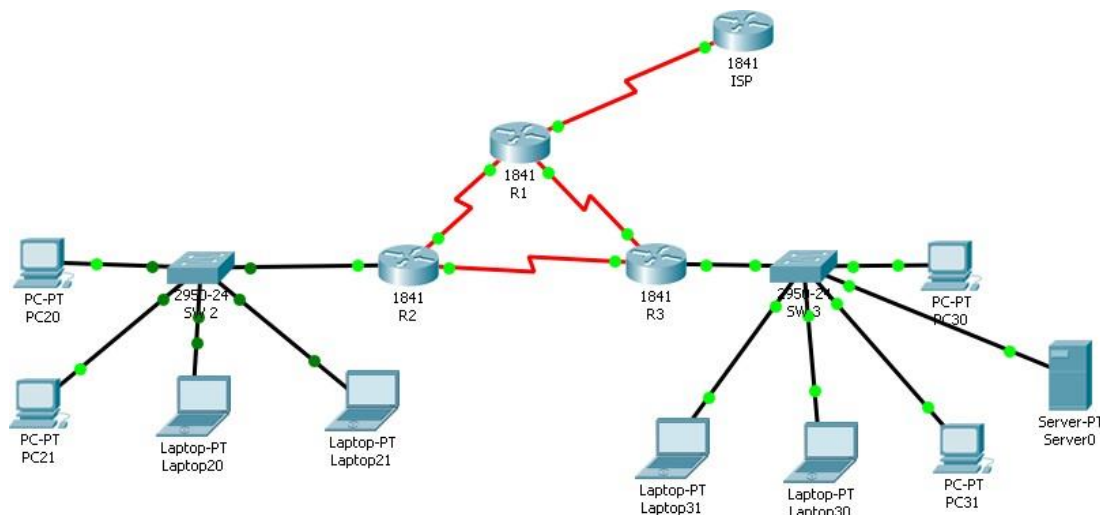
DESARROLLO DE LOS ESCENARIOS

ESCENARIO 1

TABLA DE DIRECCIONAMIENTO

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	So/o/o	200.123.211.1	255.255.255.0	N/D
R1	Seo/o/o	200.123.211.2	255.255.255.0	N/D
	Seo/1/o	10.0.0.1	255.255.255.252	N/D
	Seo/1/1	10.0.0.5	255.255.255.252	N/D
R2	Fao/o,100	192.168.20.1	255.255.255.0	N/D
	Fao/o,200	192.168.21.1	255.255.255.0	N/D
	Seo/o/o	10.0.0.2	255.255.255.252	N/D
	Seo/o/1	10.0.0.9	255.255.255.252	N/D
R3	Fao/o	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9Co:80F:301	/64	N/D
	Seo/o/o	10.0.0.6	255.255.255.252	N/D
	Seo/o/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

CONFIGURACIONES ESCENARIO 1

CONFIGURACIÓN BÁSICA R1

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#no ip domain-lookup
R1(config)#enable secret class
R1(config)#line con 0
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd $ Acceso no autorizado o prohibido! $
R1(config)#
```

CONFIGURACIÓN R2

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#no ip domain-lookup
R2(config)#enable secret class
R2(config)#line con 0
R2(config-line)#password cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#service password-encryption
R2(config)#banner motd $ Acceso no autorizado o prohibido! $
R2(config)#
```

CONFIGURACIÓN R3

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#no ip domain-lookup
R3(config)#enable secret class
R3(config)#line con 0
R3(config-line)#password cisco
```

R3(config-line)#login
R3(config-line)#exit
R3(config)#service password-encryption
R3(config)#banner motd $ Acceso no autorizado o prohibido! $
R3(config)#

CONFIGURACIÓN SW2

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW2
SW2(config)#no ip domain-lookup
SW2(config)#enable secret class
SW2(config)#line con 0
SW2(config-line)#password cisco
SW2(config-line)#login
SW2(config-line)#exit
SW2(config)#service password-encryption
SW2(config)#banner motd $ Solo personal autorizado! $
SW2(config)#

CONFIGURACIÓN SW3

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname SW3
SW3(config)#no ip domain-lookup
SW3(config)#enable secret class
SW3(config)#line con 0
SW3(config-line)#password cisco
SW3(config-line)#login
SW3(config-line)#exit
SW3(config)#service password-encryption
SW3(config)#banner motd $ Solo personal autorizado! $
SW3(config)#

TABLA DE VLAN Y 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

VLAN SW 2

SW2(config)#vlan 100
SW2(config-vlan)#name LAPTOPS
SW2(config-vlan)#vlan 200
SW2(config-vlan)#name DESTOPS
SW2(config-vlan)#

VLAN PUERTOS SW2 F0/2-3 Y F0/4-5

SW2(config)#int range f0/2-3
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 100
SW2(config-if-range)#exit
SW2(config)#int range f0/4-5
SW2(config-if-range)#switchport mode access
SW2(config-if-range)#switchport access vlan 200
SW2(config-if-range)#exit
SW2(config)#

VLAN TRONCAL SW2

SW2(config)#int range f0/2-3
SW2(config-if-range)#switchport mode trunk

SW2(config-if-range)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

%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

SW2(config-if-range)#

INTERFACE S0/0/0 ISP

Router(config)#int s0/0/0
Router(config-if)#ip address 200.123.211.1 255.255.255.0
Router(config-if)#no shutdown

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

INTERFACE S0/0/0 –R1

R1(config)#int s0/0/0
R1(config-if)#ip address 200.123.211.2 255.255.255.0
R1(config-if)#no shutdown

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

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

R1(config-if)#exit

INTERFACE S0/1/0 –R1

R1(config)#int s0/1/0
R1(config-if)#ip address 10.0.0.1 255.255.255.252
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
R1(config-if)#exit

INTERFACE S0/1/1 –R1

R1(config)#int s0/1/1
R1(config-if)#ip address 10.0.0.5 255.255.255.252
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
R1(config-if)#

INTERFACE S0/0/0 –R2

R2(config)#int s0/0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
R2(config-if)#no shutdown

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

R2(config-if)#exit

INTERFACE S0/0/1 –R2

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

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

INTERFACE S0/0/0 –R3

R3(config)#int s0/0/0
R3(config-if)#ip address 10.0.0.6 255.255.255.252
R3(config-if)#no shutdown

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

R3(config-if)#exit

INTERFACE S0/0/1 –R3

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

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

R3(config-if)#exit

INTERFACE F0/0 –R3

R3(config)#int f0/0
R3(config-if)#ip address 192.168.30.1 255.255.255.0
R3(config-if)#no shutdown

R3(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

R3(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64
R3(config-if)#no shutdown
R3(config-if)#

INTERFACE F0/0.100 –R2
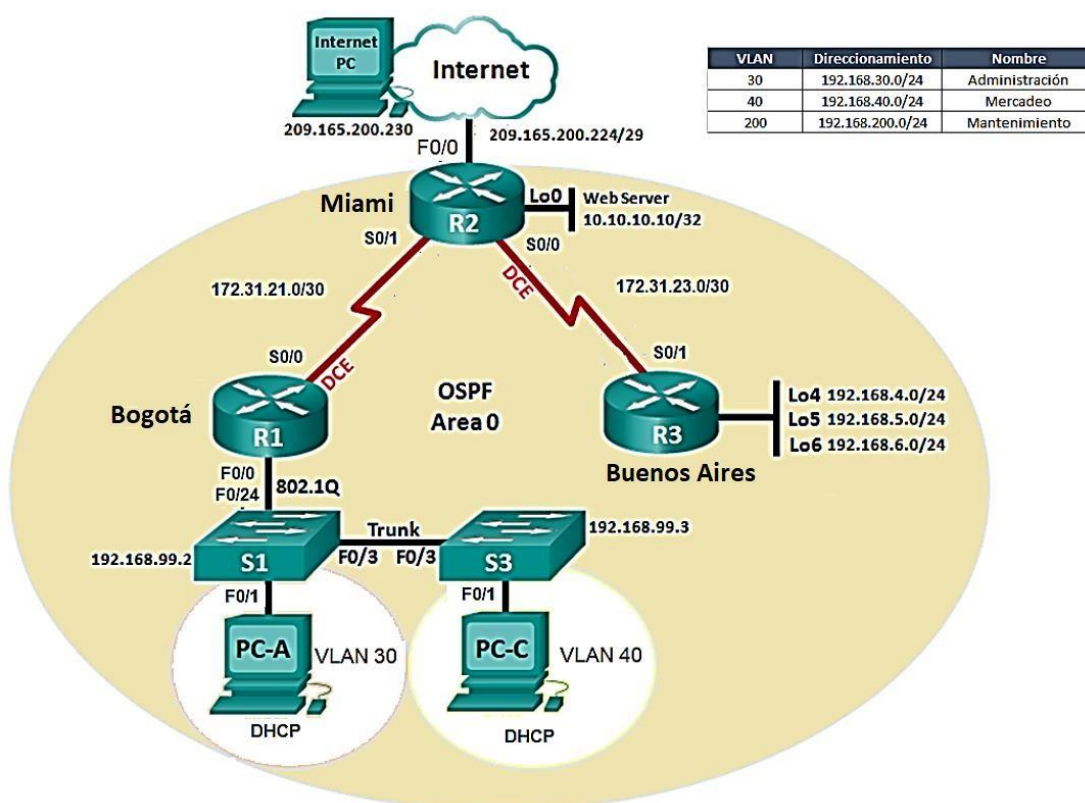
R2(config)#int f0/0.100
R2(config-subif)#encap dot1q 100
R2(config-subif)#ip address 192.168.21.1 255.255.255.0
R2(config-subif)#no shutdown
R2(config-subif)#exit

INTERFACE F0/0.200 –R2

R2(config)#int f0/0.200
R2(config-subif)#encap dot1q 200
R2(config-subif)#ip address 192.168.20.1 255.255.255.0
R2(config-subif)#no shutdown
R2(config-subif)#exit
R2(config)#

ESCENARIO 2

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

Internet PC
209.165.200.230
Internet
209.165.200.224/29
F0/0

Miami
R2
Lo0 Web Server
10.10.10.10/32
S0/1
S0/0

172.31.21.0/30
DCE
172.31.23.0/30

S0/0
DCE
S0/1

OSPF
Area 0

Bogotá
R1

R3
Buenos Aires
Lo4 192.168.4.0/24
Lo5 192.168.5.0/24
Lo6 192.168.6.0/24

F0/0
F0/24 802.1Q

192.168.99.2
S1
F0/3 Trunk F0/3
S3
192.168.99.3

F0/1
F0/1

PC-A VLAN 30
PC-C VLAN 40

DHCP
DHCP

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

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.

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

2. En el Switch 3 deshabilitar DNS lookup

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

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

5. Implement DHCP and NAT for IPv4

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

7. 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.

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

9. 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.

10. 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.

11. Verificar procesos de comunicación y redireccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.
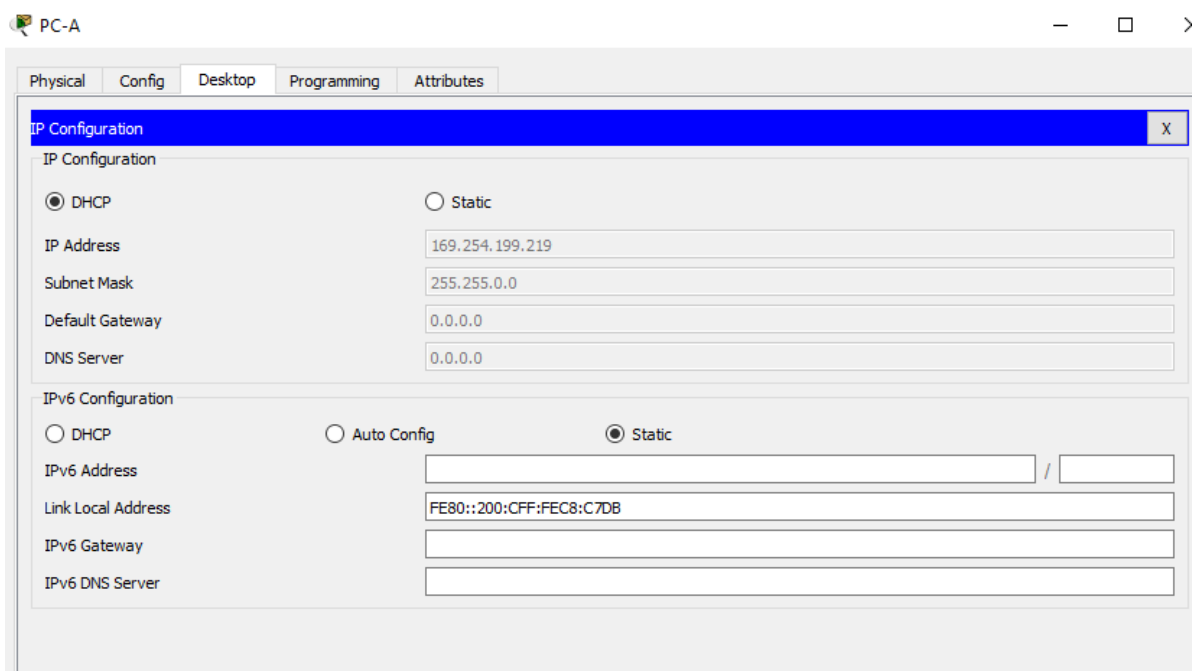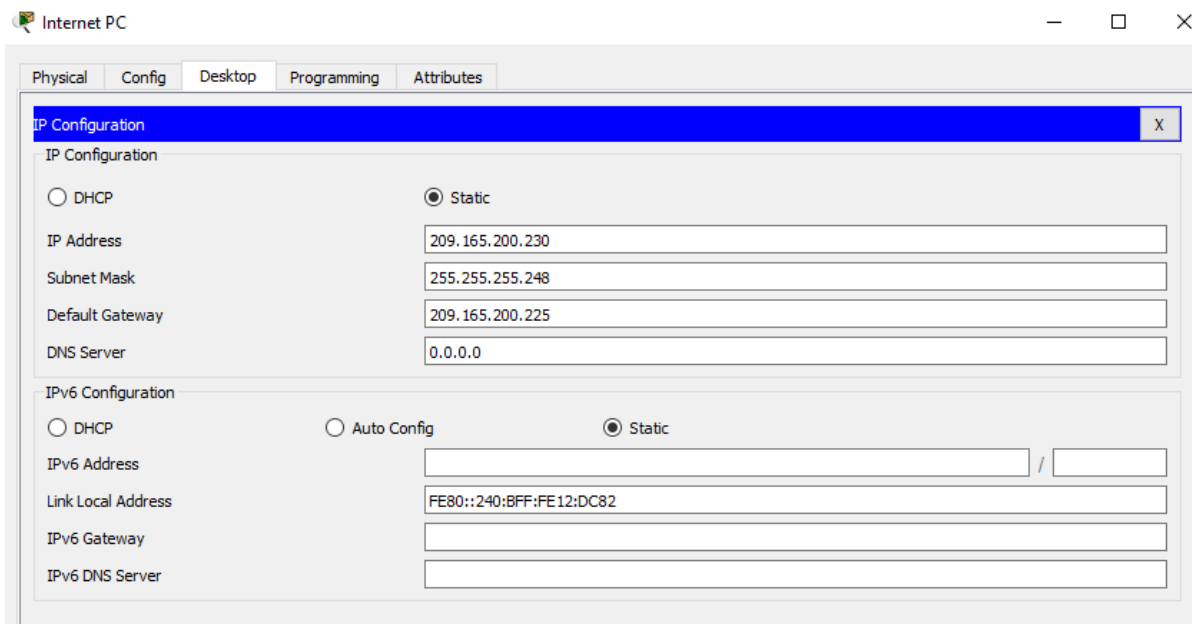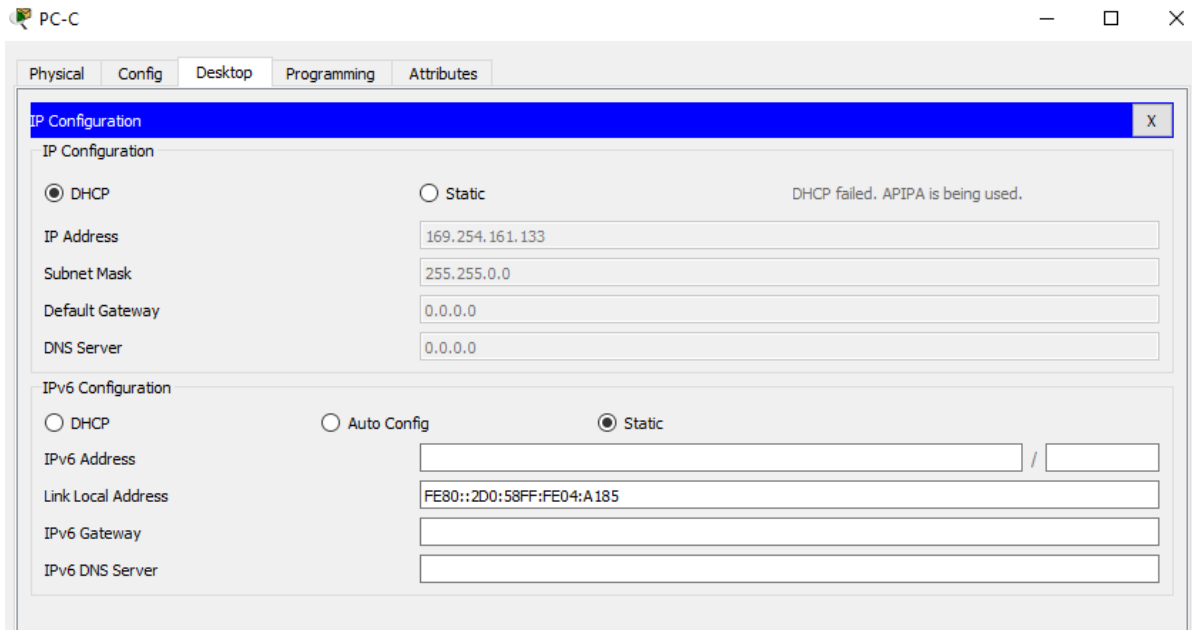
DESARROLLO ESCENARIO 2

Topología
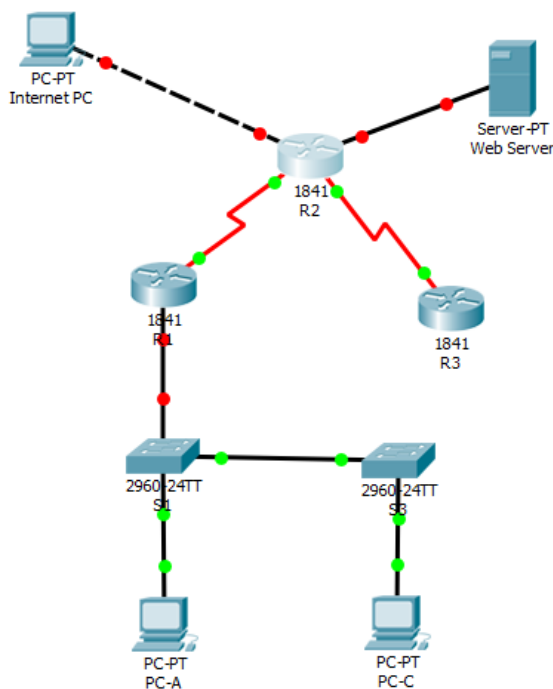
Nota: es necesario adjuntar el servidor dado que no se soporta http

Habilitación de DHCP en PC-A y PC-C

PC-C — □ ×

| Physical | Config | Desktop | Programming | Attributes |

IP Configuration   X

IP Configuration

◉ DHCP   ○ Static   DHCP failed. APIPA is being used.

IP Address   169.254.161.133
Subnet Mask   255.255.0.0
Default Gateway   0.0.0.0
DNS Server   0.0.0.0

IPv6 Configuration

○ DHCP   ○ Auto Config   ◉ Static
IPv6 Address   /
Link Local Address   FE80::2D0:58FF:FE04:A185
IPv6 Gateway
IPv6 DNS Server

Internet PC — □ ×

| Physical | Config | Desktop | Programming | Attributes |

IP Configuration   X

IP Configuration

○ DHCP   ◉ Static

IP Address   209.165.200.230
Subnet Mask   255.255.255.248
Default Gateway   209.165.200.225
DNS Server   0.0.0.0

IPv6 Configuration

○ DHCP   ○ Auto Config   ◉ Static
IPv6 Address   /
Link Local Address   FE80::240:BFF:FE12:DC82
IPv6 Gateway
IPv6 DNS Server
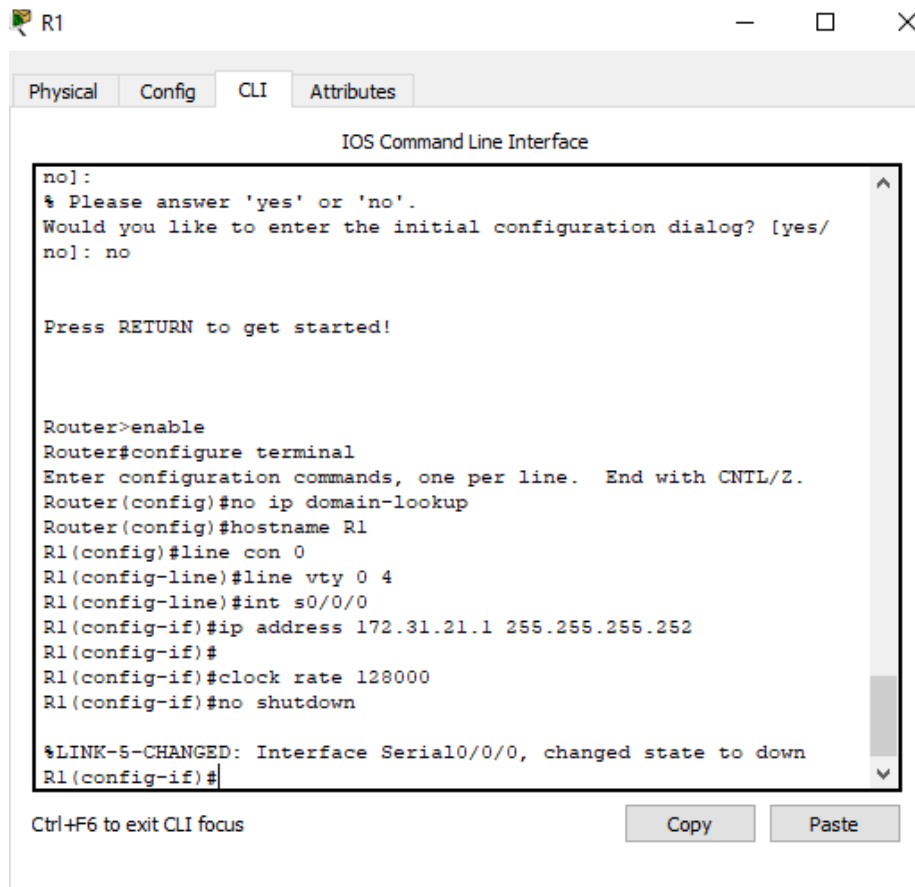
Configuración inicial en R1

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R1
R1(config)#line con 0
R1(config-line)#line vty 0 4
R1(config-line)#int s0/0/0
R1(config-if)#ip address 172.31.21.1 255.255.255.252

R1(config-if)#
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown

```
R1                                                    —    □    ×

Physical    Config    CLI    Attributes

                    IOS Command Line Interface

no]:
% Please answer 'yes' or 'no'.
Would you like to enter the initial configuration dialog? [yes/
no]: no


Press RETURN to get started!



Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R1
R1(config)#line con 0
R1(config-line)#line vty 0 4
R1(config-line)#int s0/0/0
R1(config-if)#ip address 172.31.21.1 255.255.255.252
R1(config-if)#
R1(config-if)#clock rate 128000
R1(config-if)#no shutdown

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

Ctrl+F6 to exit CLI focus                      Copy       Paste
```
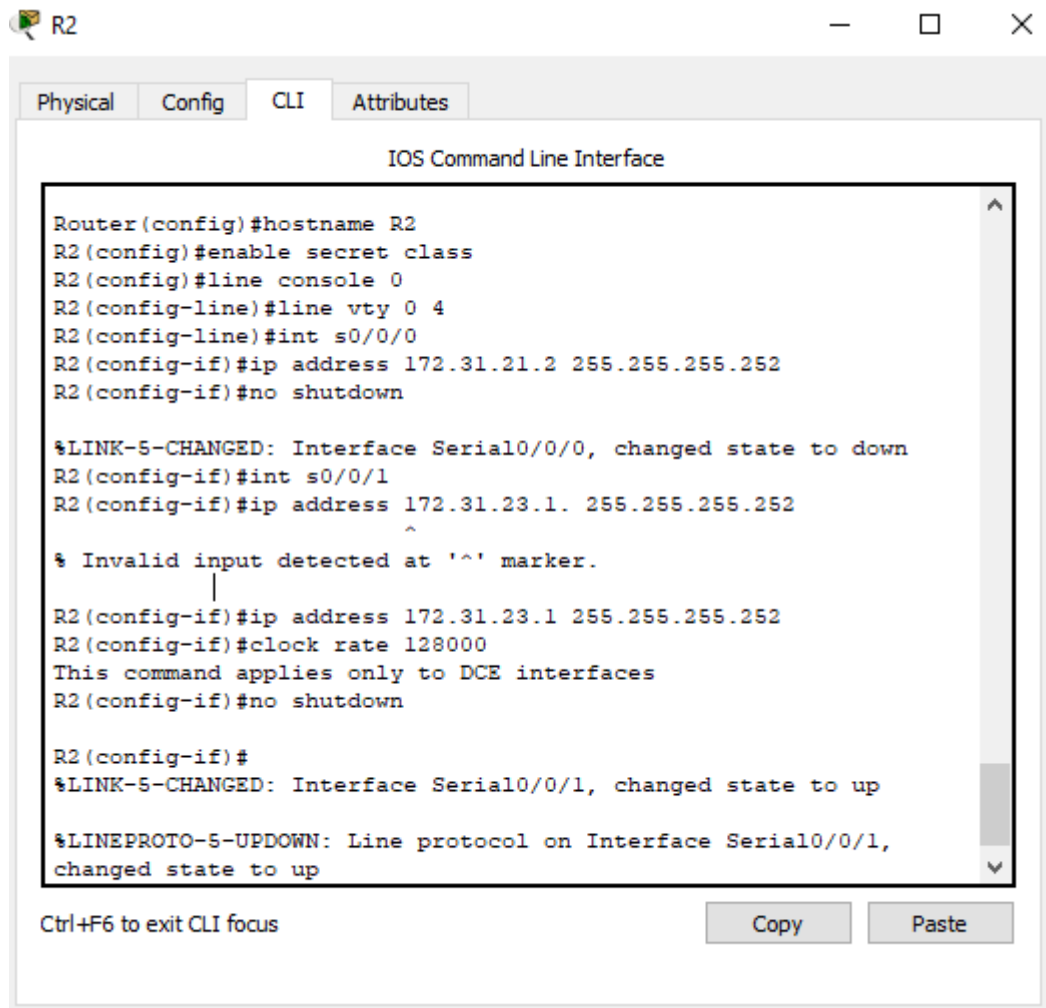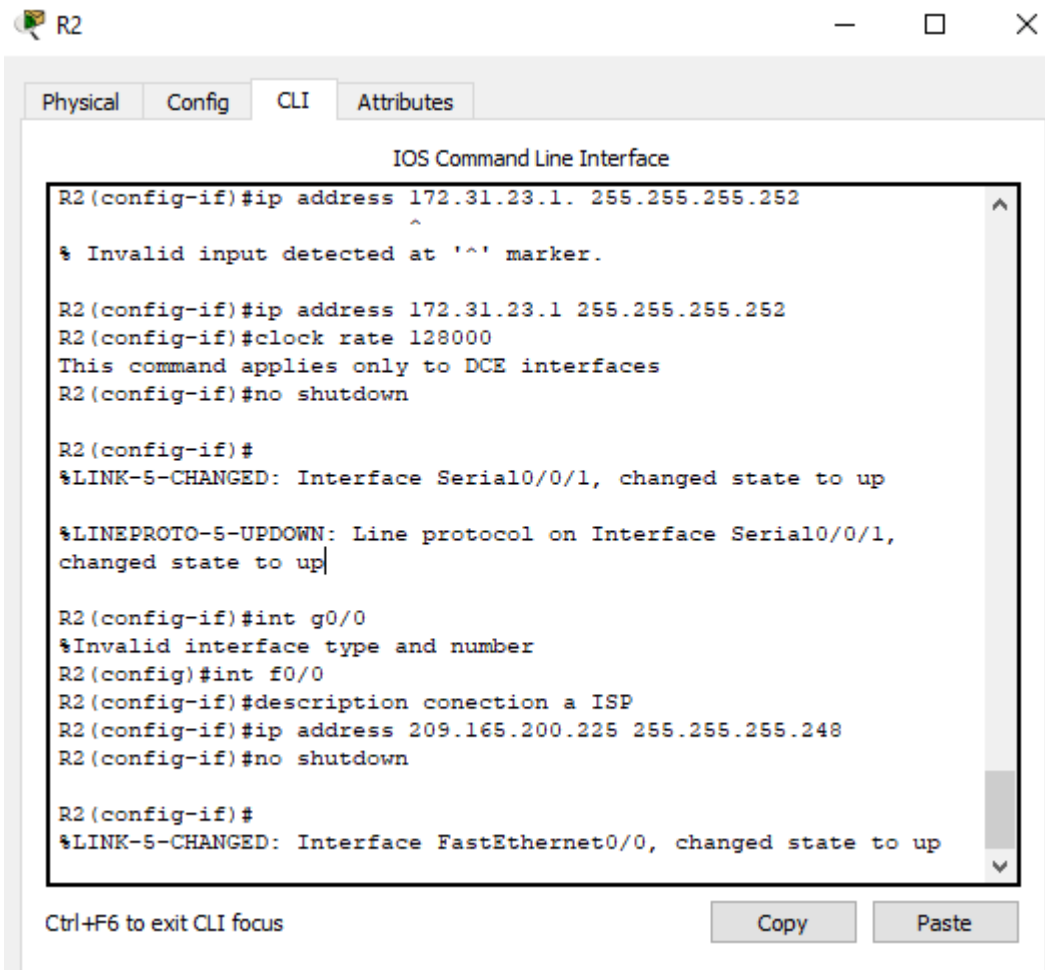
Configuración inicial en R2

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R2
R2(config)#line console 0
R2(config-line)#line vty 0 4
R2(config-line)#int s0/0/0
R2(config-if)#ip address 172.31.21.2 255.255.255.252
R2(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R2(config-if)#int s0/0/1
R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#clock rate 128000
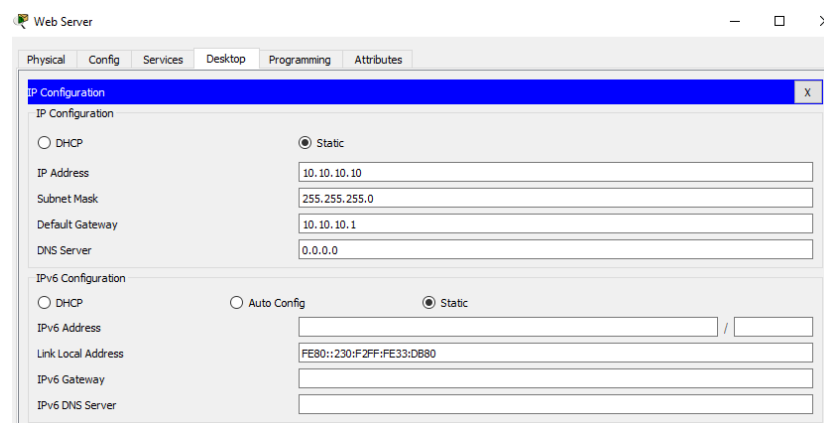This command applies only to DCE interfaces
R2(config-if)#no shutdown

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

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R2(config)#int f0/0
R2(config-if)#description conection a ISP
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shutdown

```
R2
                                                        ─   □   ×

Physical    Config    CLI    Attributes

                        IOS Command Line Interface

R2(config-if)#ip address 172.31.23.1. 255.255.255.252
                              ^
% Invalid input detected at '^' marker.

R2(config-if)#ip address 172.31.23.1 255.255.255.252
R2(config-if)#clock rate 128000
This command applies only to DCE interfaces
R2(config-if)#no shutdown

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up

R2(config-if)#int g0/0
%Invalid interface type and number
R2(config)#int f0/0
R2(config-if)#description conection a ISP
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shutdown

R2(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

Ctrl+F6 to exit CLI focus                        Copy        Paste
```

Configuración de Web Server

```
Web Server                                         ─   □   ×

Physical   Config   Services   Desktop   Programming   Attributes

IP Configuration                                              X

IP Configuration

○ DHCP                        ⦿ Static
IP Address                    10.10.10.10
Subnet Mask                   255.255.255.0
Default Gateway               10.10.10.1
DNS Server                    0.0.0.0

IPv6 Configuration

○ DHCP          ○ Auto Config          ⦿ Static
IPv6 Address                                            /
Link Local Address            FE80::230:F2FF:FE33:DB80
IPv6 Gateway
IPv6 DNS Server
```
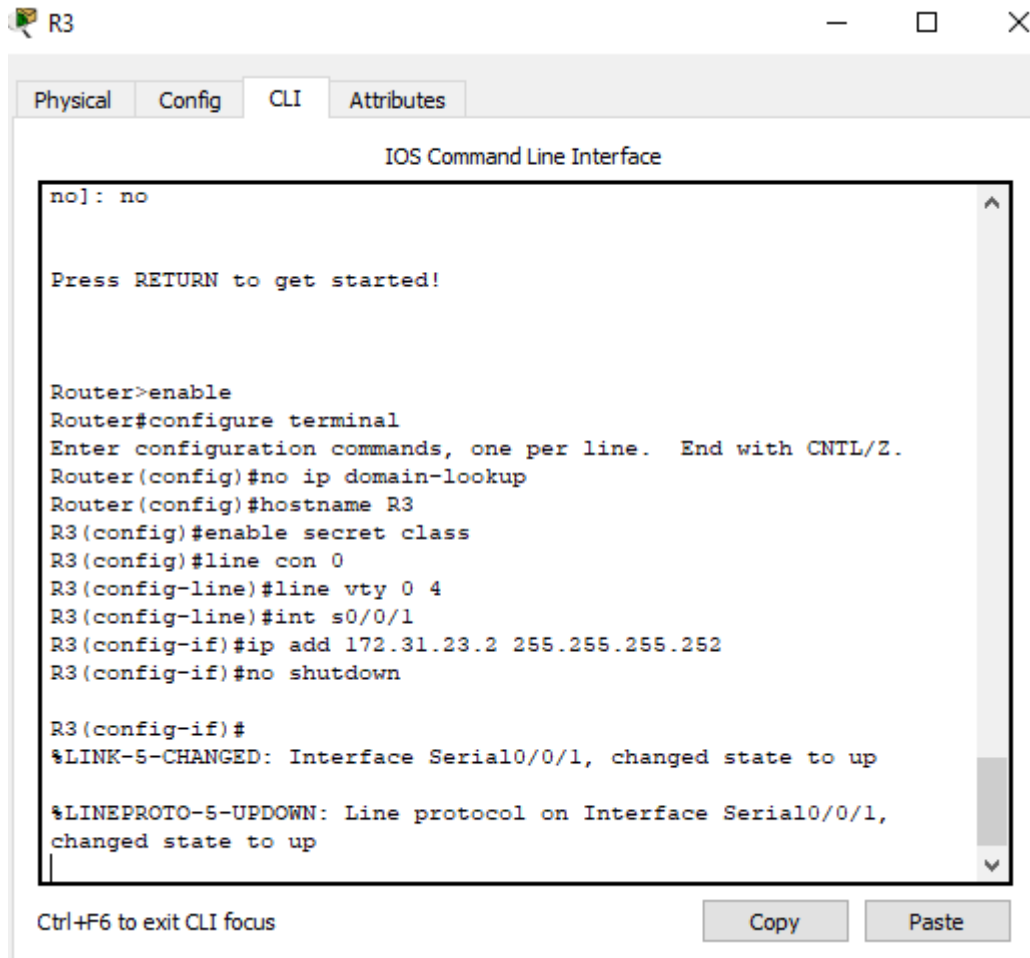
Configuración en router 3

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R3
R3(config)#line con 0

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R3(config-line)#line vty 0 4
R3(config-line)#int s0/0/1
R3(config-if)#ip add 172.31.23.2 255.255.255.252
R3(config-if)#no shutdown

```
R3                                                    —    □    ×

Physical   Config   CLI   Attributes

                    IOS Command Line Interface

no]: no


Press RETURN to get started!



Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#hostname R3
R3(config)#enable secret class
R3(config)#line con 0
R3(config-line)#line vty 0 4
R3(config-line)#int s0/0/1
R3(config-if)#ip add 172.31.23.2 255.255.255.252
R3(config-if)#no shutdown

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

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up


Ctrl+F6 to exit CLI focus                      Copy      Paste
```

R3(config-if)#ip add 192.168.4.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#int lo5

R3(config-if)#
%LINK-5-CHANGED: Interface Loopback5, changed state to up

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

R3(config-if)#ip add 192.168.5.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#int lo6

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

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%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up
R3(config-if)#ip add 192.168.6.1 255.255.255.0
R3(config-if)#no shut
R3(config-if)#

Configuracion S1
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#no ip domain-lookup
Switch(config)#hostname S1
S1(config)#line console 0
S1(config-line)#line vty o 4
^
% Invalid input detected at '^' marker.
S1(config-line)#line vty 0 4
S1(config-line)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#copy running-config start
Destination filename [startup-config]?
Building configuration...
[OK]
S1#
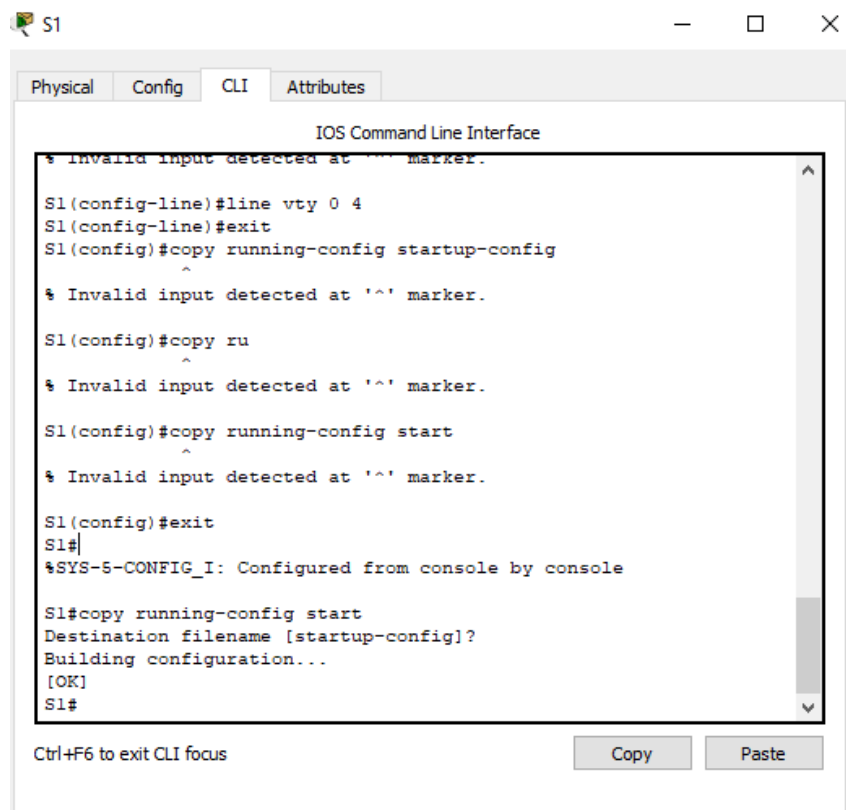
19

Configuraciones en R1

R1#enable

R1#configure terminal

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

R1(config)#interface f0/0.30

R1(config-subif)#encapsulation dot1Q 30

R1(config-subif)#encapsulation dot1Q 30

R1(config-subif)#ip address 192.168.30.1 255.255.255.0

R1(config-subif)#exit

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
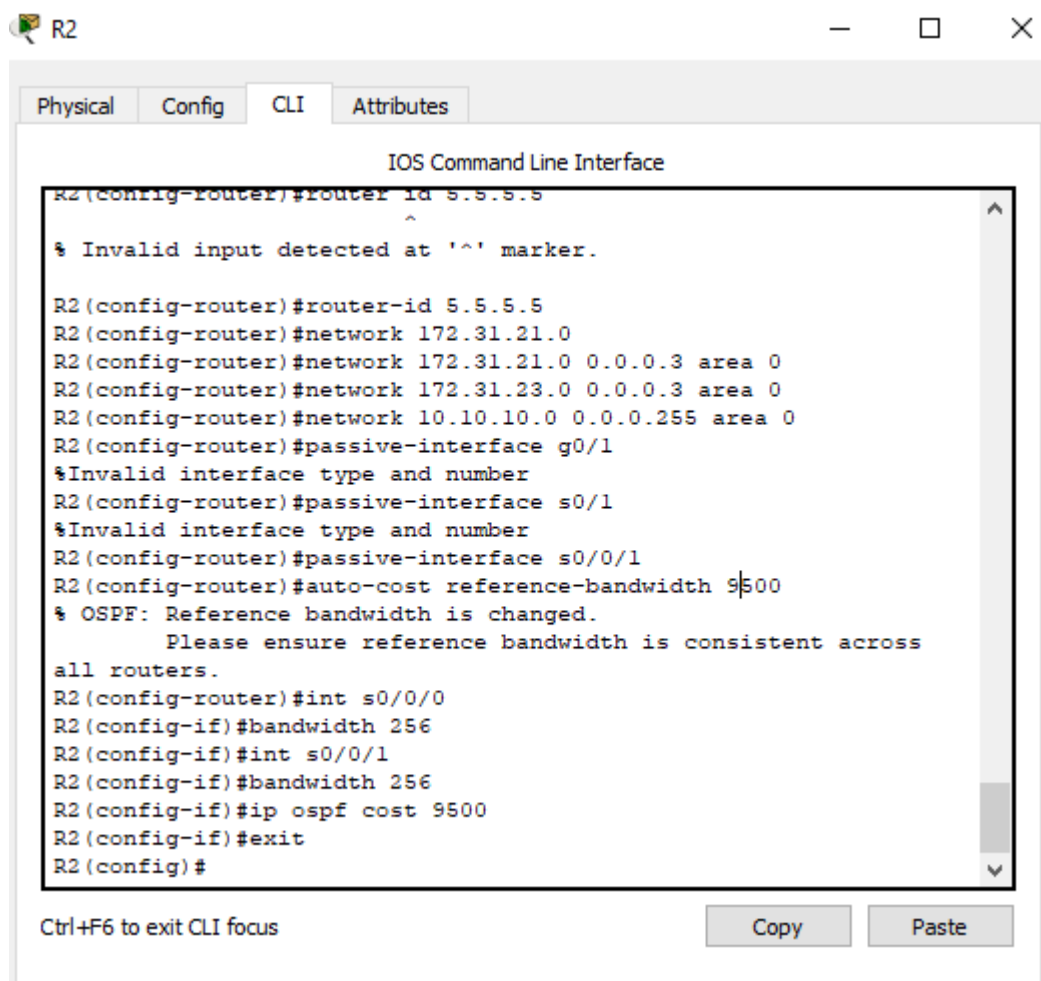
R1(config-router)#network 192.168.30.0 0.0.0.3 area 0

R1(config-router)#network 192.168.40.0 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)#passive-interface f0/0.30

R1(config-router)#passive-interface f0/0.40

R1(config-router)#passive-interface f0/0.200

%Invalid interface type and number

R1(config-router)#auto-cost reference-bandwidth 9500

% OSPF: Reference bandwidth is changed.

        Please ensure reference bandwidth is consistent across all routers.

R1(config-router)#exit

R1(config)#int s0/0/1

R1(config-if)#bandwidth 256

R1(config-if)#ip ospf cost 9500

R1(config-if)#

R1#

```
R1                                                    —    □    ✕

Physical    Config    CLI    Attributes

                   IOS Command Line Interface

R1(config-subif)#encapsulation dot1Q 30
R1(config-subif)#ip address 192.168.30.1 255.255.255.0
R1(config-subif)#exit
R1(config)#exerouter 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 0.0.0.3 area 0
R1(config-router)#network 192.168.40.0 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)#passive-interface f0/0.30
R1(config-router)#passive-interface f0/0.40
R1(config-router)#passive-interface f0/0.200
%Invalid interface type and number
R1(config-router)#auto-cost reference-bandwidth 9500
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across
all routers.
R1(config-router)#exit
R1(config)#int s0/0/1
R1(config-if)#int s0/0/1
R1(config-if)#bandwidth 256
R1(config-if)#ip ospf cost 9500
R1(config-if)#

Ctrl+F6 to exit CLI focus                    Copy        Paste
```
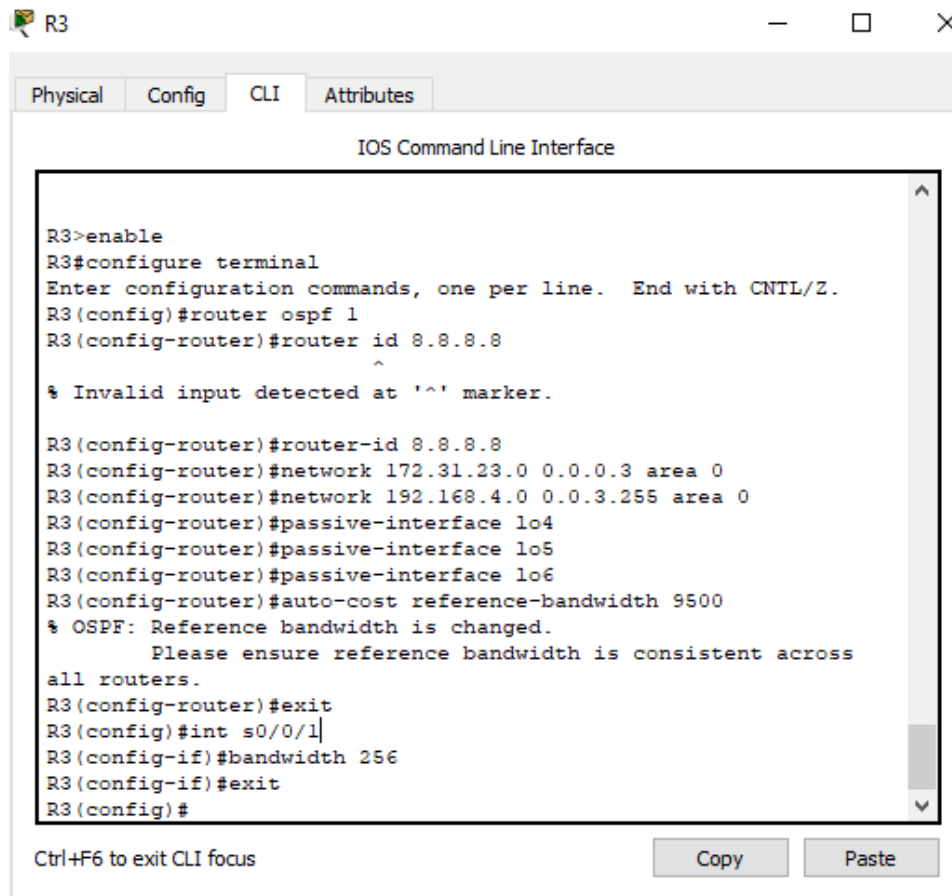
Configuraciones en R2

R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#router-id 5.5.5.5
R2(config-router)#network 172.31.21.0
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#network 172.31.23.0 0.0.0.3 area 0
R2(config-router)#network 10.10.10.0 0.0.0.255 area 0
R2(config-router)#passive-interface g0/1
%Invalid interface type and number

R2(config-router)#passive-interface s0/1
%Invalid interface type and number
R2(config-router)#passive-interface s0/0/1
R2(config-router)#auto-cost reference-bandwidth 9500
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all routers.
R2(config-router)#int s0/0/0
R2(config-if)#bandwidth 256
R2(config-if)#int s0/0/1
R2(config-if)#bandwidth 256
R2(config-if)#ip ospf cost 9500
R2(config-if)#exit
R2(config)#

Configuracion en R3

R3>enable
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#router id 8.8.8.8
^
% Invalid input detected at '^' marker.

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 0.0.3.255 area 0
R3(config-router)#passive-interface lo4
R3(config-router)#passive-interface lo5
R3(config-router)#passive-interface lo6
R3(config-router)#auto-cost reference-bandwidth 9500
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across all routers.
R3(config-router)#exit
R3(config)#int s0/0/1
R3(config-if)#bandwidth 256
R3(config-if


```
R3>enable
R3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#router id 8.8.8.8
                        ^
% Invalid input detected at '^' marker.

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 0.0.3.255 area 0
R3(config-router)#passive-interface lo4
R3(config-router)#passive-interface lo5
R3(config-router)#passive-interface lo6
R3(config-router)#auto-cost reference-bandwidth 9500
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across
all routers.
R3(config-router)#exit
R3(config)#int s0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#exit
R3(config)#
```

Visualizar la lista resumida de interfaces por ospf en donde se ilustre el costo de la interface

```
R2#show ip ospf interface

Serial0/0/0 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: 6152
  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
  Suppress hello for 0 neighbor(s)
R2#
```

Ctrl+F6 to exit CLI focus   Copy   Paste

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

S1>enable
S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name mantenimiento
S1(config-vlan)#exit

```
S1>enable
S1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name mantenimiento
S1(config-vlan)#exit
S1(config)#
S1#
%SYS-5-CONFIG_I: Configured from console by console

S1#
```

Ctrl+F6 to exit CLI focus   Copy   Paste

S1(config-if)#ip add 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int f0/3
S1(config-if)#switchport mode trunk

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

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

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

S1(config-if)#switchport
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk

S1(config-if)#switchport trunk native vlan 1

```
%LINK-5-CHANGED: Interface Vlan200, changed state to up

S1(config-if)#ip add 192.168.99.2 255.255.255.0
S1(config-if)#no shut
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int f0/3
S1(config-if)#switchport mode trunk

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

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

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

S1(config-if)#switchport
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#
```

Ctrl+F6 to exit CLI focus

S1(config-if)#switchport
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#int range fa0/2, fa0/4-23, g0/1-2
S1(config-if-range)#switch mode access
S1(config-if-range)#int fa0/1
S1(config-if)#switch mode access
S1(config-if)#switch acces vlan
% Incomplete command.
S1(config-if)#switch access vlan
% Incomplete command.
S1(config-if)#switch 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 GigabitEthernet0/1, changed state to administratively down

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to administratively down
    S1(config-if-range)#

```
S1                                                    —    □

Physical    Config    CLI    Attributes

                        IOS Command Line Interface

state to up

S1(config-if)#switchport
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int f0/24
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#exit
S1(config)#int range fa0/2, fa0/4-23, g0/1-2
S1(config-if-range)#switch mode access
S1(config-if-range)#int fa0/1
S1(config-if)#switch mode access
S1(config-if)#switch acces vlan
% Incomplete command.
S1(config-if)#switch access vlan
% Incomplete command.
S1(config-if)#switch 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

Ctrl+F6 to exit CLI focus                        Copy        Paste
```

Configuración en S3

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 30
Switch(config-vlan)#name administracion
Switch(config-vlan)#vlan 40
Switch(config-vlan)#name mercadeo
Switch(config-vlan)#vlan 200
Switch(config-vlan)#name mantenimiento
Switch(config-vlan)#exit
Switch(config)#int vlan 200
Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan200, changed state to up
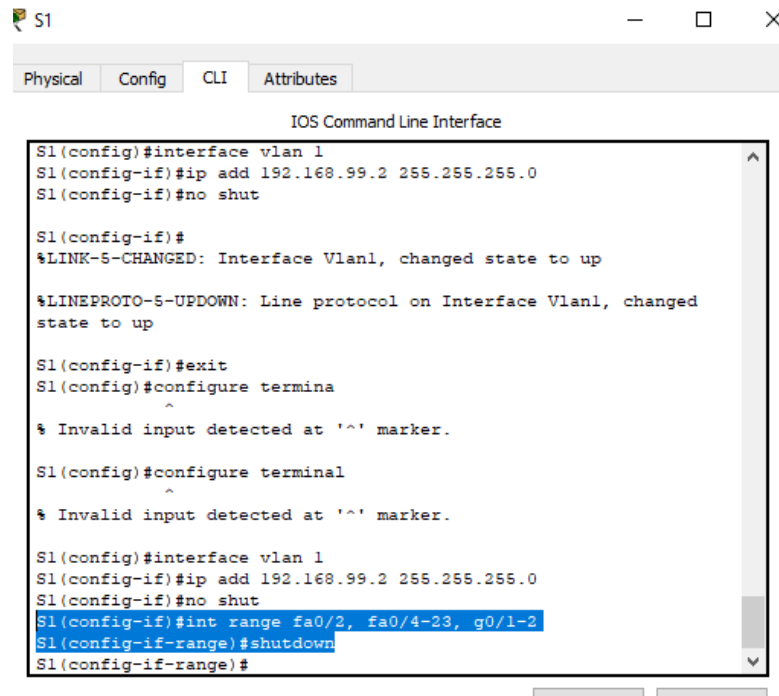Switch(config-if)#ip add 192.168.99.3 255.255.255.0
Switch(config-if)#no shut
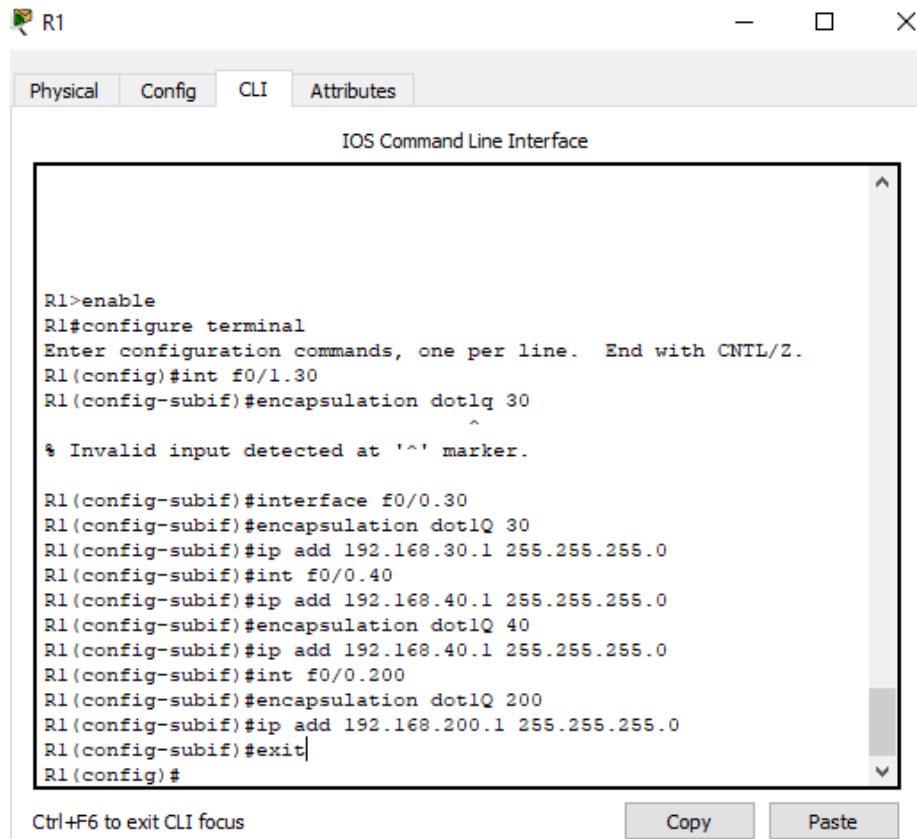
Switch(config-if)#exit
Switch(config)#ip default-gateway 192.168.99.1
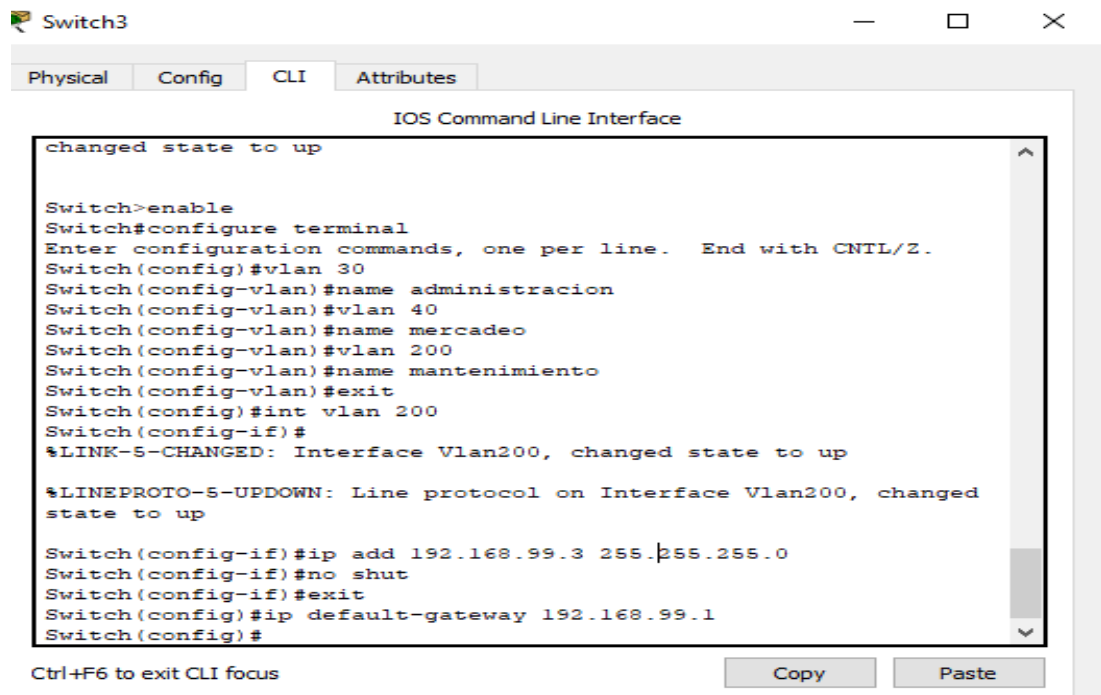
Configuraciones en r1

R1>enable
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int f0/1.30
R1(config-subif)#encapsulation dotlq 30
^
% Invalid input detected at '^' marker.
R1(config-subif)#interface f0/0.30
R1(config-subif)#encapsulation 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)#encapsulation 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)#encapsulation dot1Q 200
R1(config-subif)#ip add 192.168.200.1 255.255.255.0

R1(config-subif)#exit

En el Switch 3 deshabilitar DNS lookup

Asignar direcciones IP a los Switches acorde a los lineamientos.

S1(config)#interface vlan 1
S1(config-if)#ip add 192.168.99.2 255.255.255.0

S1(config-if)#no shut

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int vlan 1
Switch(config-if)#ip add 192.168.99.3 255.255.255.0
Switch(config-if)#no shut

Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

Switch(config-if)#exit
Switch(config)#ip default-gateway 192.168.99.1
Switch(config)#exit

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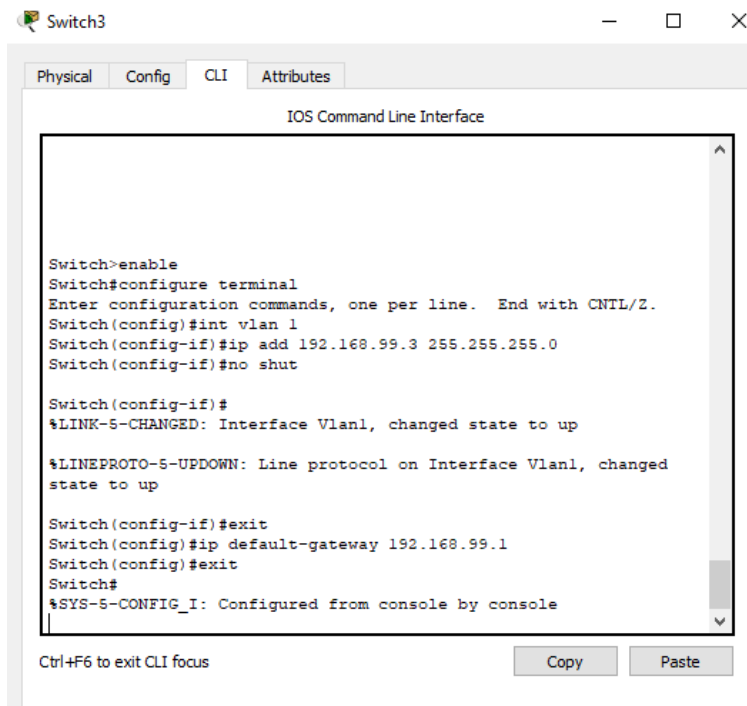
Desactivar todas las interfaces que no sean utilizadas en el esquema de red.

S1(config-if)#int range fa0/2, fa0/4-23, g0/1-2
S1(config-if-range)#shutdown

S3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#int range fa0/2, fa0/4-24, g0/1-2
S3(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
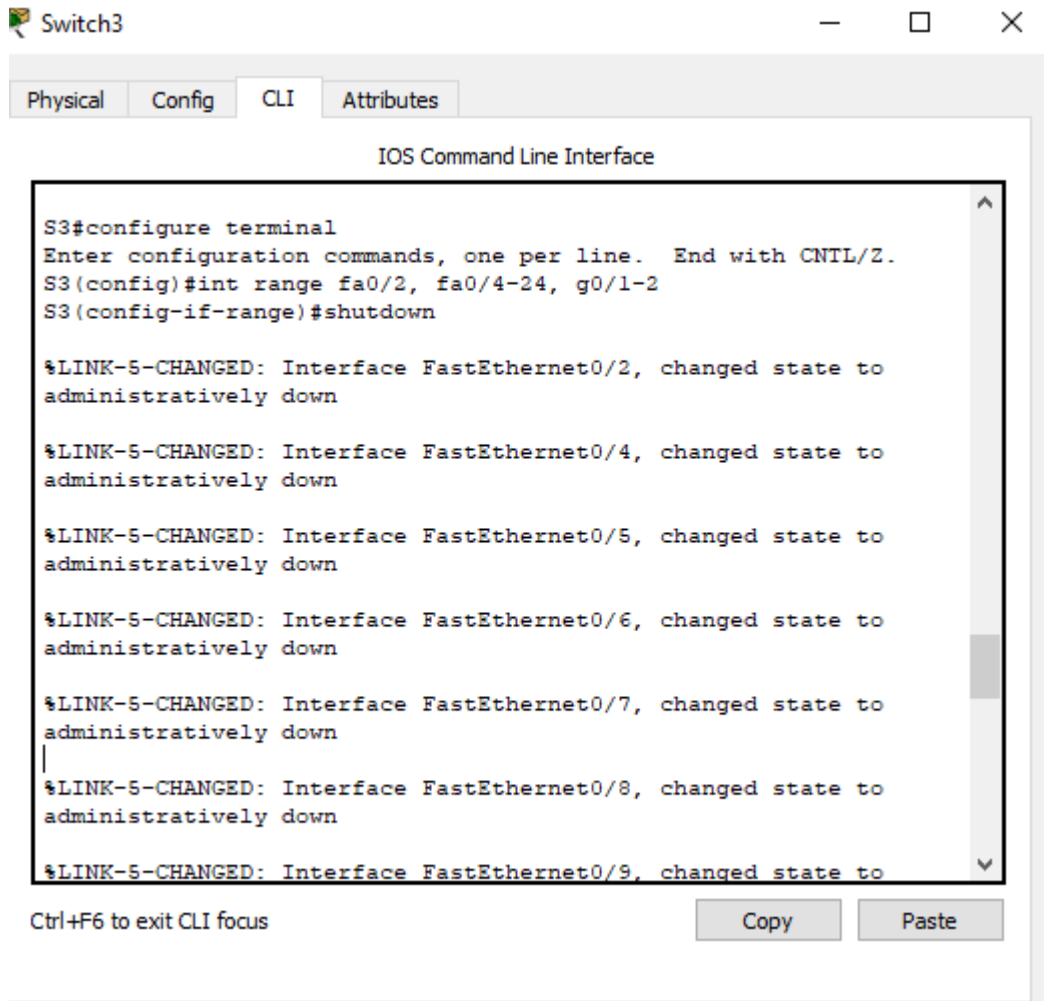
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to administratively down

%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
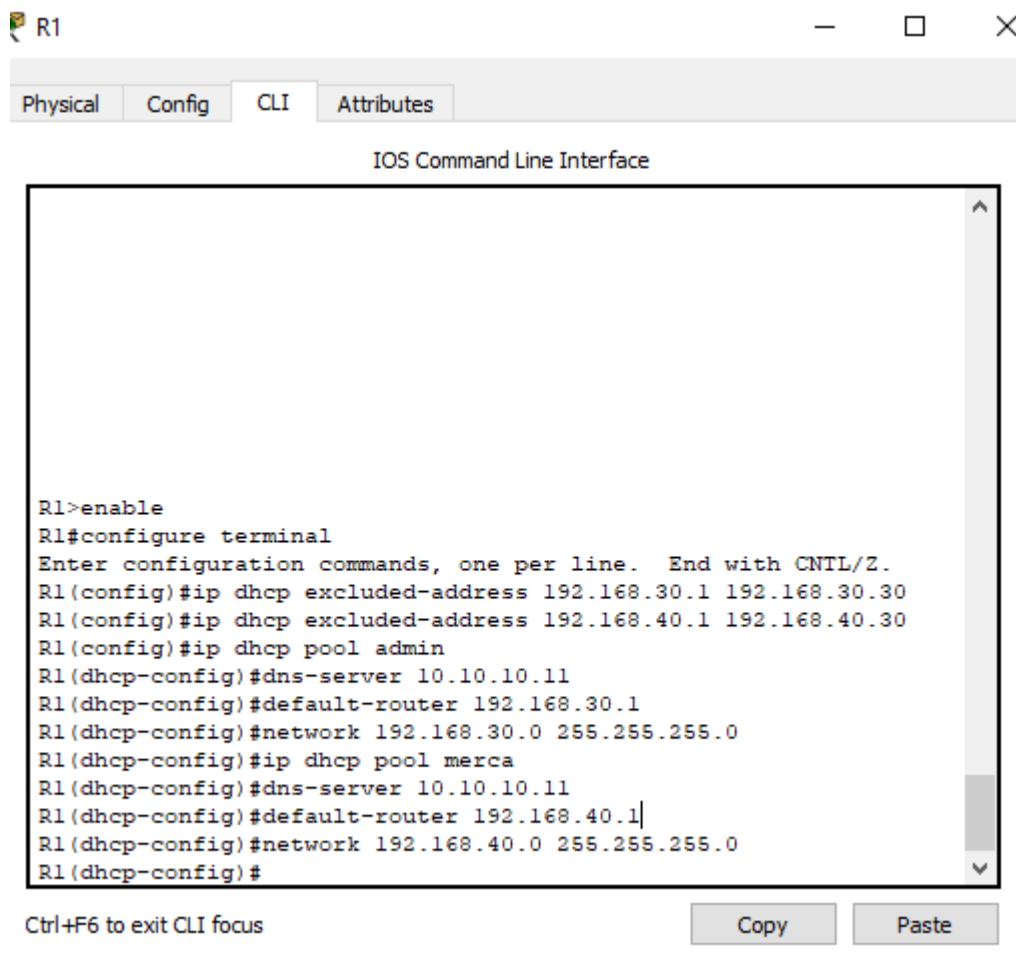S3(config-if-range)#
S3#

%SYS-5-CONFIG_I: Configured from console by console

```
Switch3                                        —    □    ✕

Physical    Config    CLI    Attributes

                  IOS Command Line Interface

S3#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
S3(config)#int range fa0/2, fa0/4-24, g0/1-2
S3(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

Ctrl+F6 to exit CLI focus                    Copy        Paste
```

Configuraciones finales en R1

R1#configure terminal
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 admin
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#ip dhcp pool merca
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0

R1(dhcp-config)#

```
R1                                                        —    □    ✕

Physical   Config   CLI   Attributes

              IOS Command Line Interface

R1>enable
R1#configure terminal
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 admin
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#ip dhcp pool merca
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#

Ctrl+F6 to exit CLI focus                    Copy        Paste
```

Configuraciones finales en R2

R2>enable
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#user webuser privilege 15 secret cisco12345
R2(config)#ip http server
^
% Invalid input detected at '^' marker.

R2(config)#

```
R2                                              —    □    ×

Physical    Config    CLI    Attributes

                    IOS Command Line Interface

 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
 changed state to down

 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
 changed state to up


 R2>enable
 R2#configure terminal
 Enter configuration commands, one per line.  End with CNTL/Z.
 R2(config)#user webuser privilege 15 secret cisco2345
 R2(config)#ip http server
                    ^
 % Invalid input detected at '^' marker.

 R2(config)#

Ctrl+F6 to exit CLI focus               Copy        Paste
```
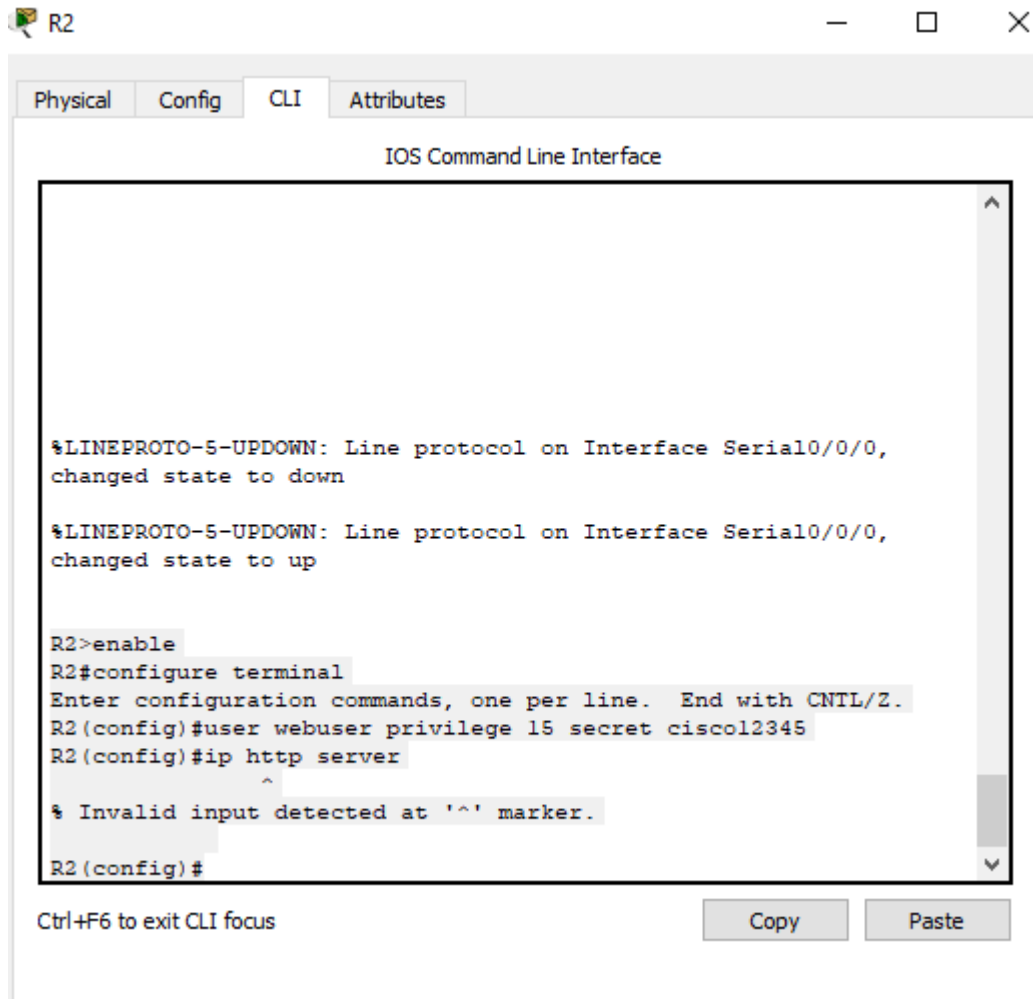
Se debe tener en cuenta que se empleó un servidor dentro de la topología.

R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#int f0/0
R2(config-if)#ip nat out
R2(config-if)#ip nat outside
R2(config-if)#int f0/1
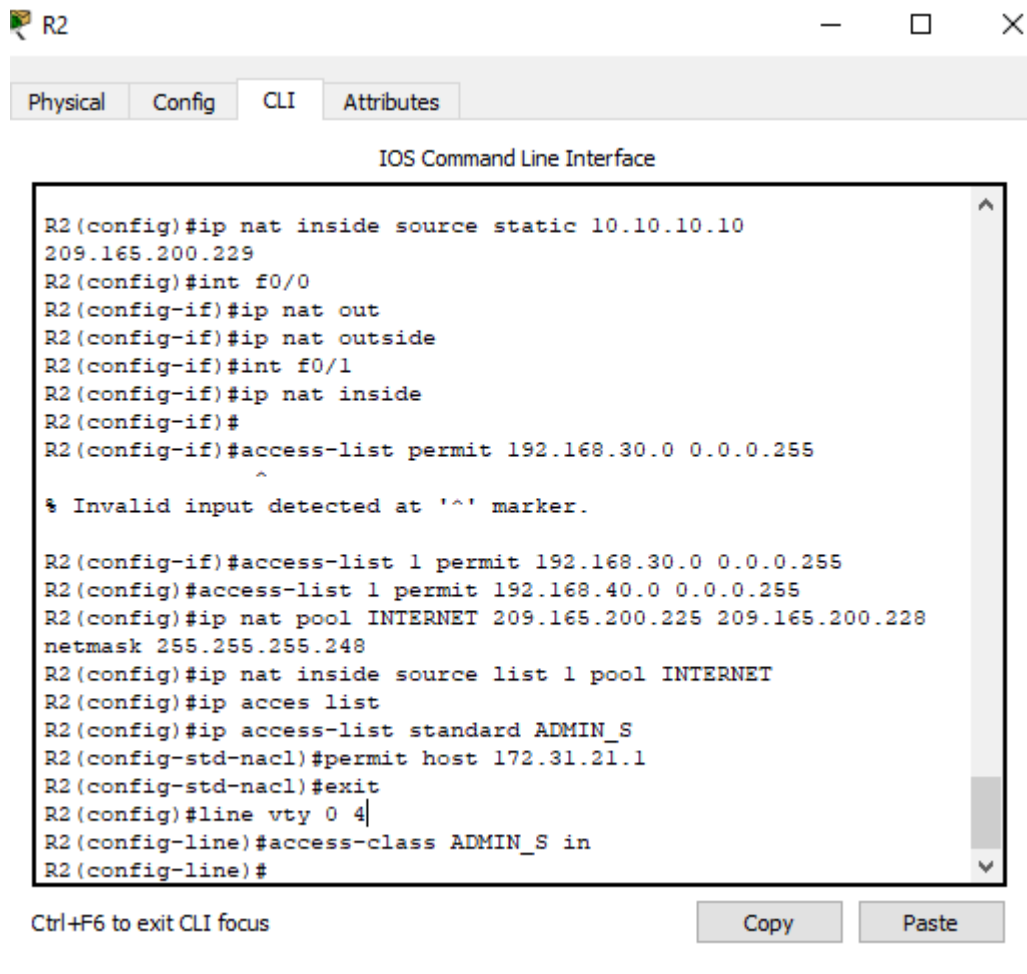R2(config-if)#ip nat inside

R2(config-if)#

R2(config-if)#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)#ip nat pool INTERNET 209.165.200.225 209.165.200.228 netmask 255.255.255.248
R2(config)#ip nat inside source list 1 pool INTERNET

    R2(config)#

```
R2                                                    —    □    ×

Physical   Config   CLI   Attributes

                    IOS Command Line Interface

R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#user webuser privilege 15 secret cisco12345
R2(config)#ip http server
              ^
% Invalid input detected at '^' marker.

R2(config)#ip nat inside source static 10.10.10.10
209.165.200.229
R2(config)#int f0/0
R2(config-if)#ip nat out
R2(config-if)#ip nat outside
R2(config-if)#int f0/1
R2(config-if)#ip nat inside
R2(config-if)#
R2(config-if)#access-list permit 192.168.30.0 0.0.0.255
                ^|
% Invalid input detected at '^' marker.

R2(config-if)#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)#ip nat pool INTERNET 209.165.200.225 209.165.200.228
netmask 255.255.255.248
R2(config)#ip nat inside source list 1 pool INTERNET
R2(config)#

Ctrl+F6 to exit CLI focus                          Copy        Paste
```
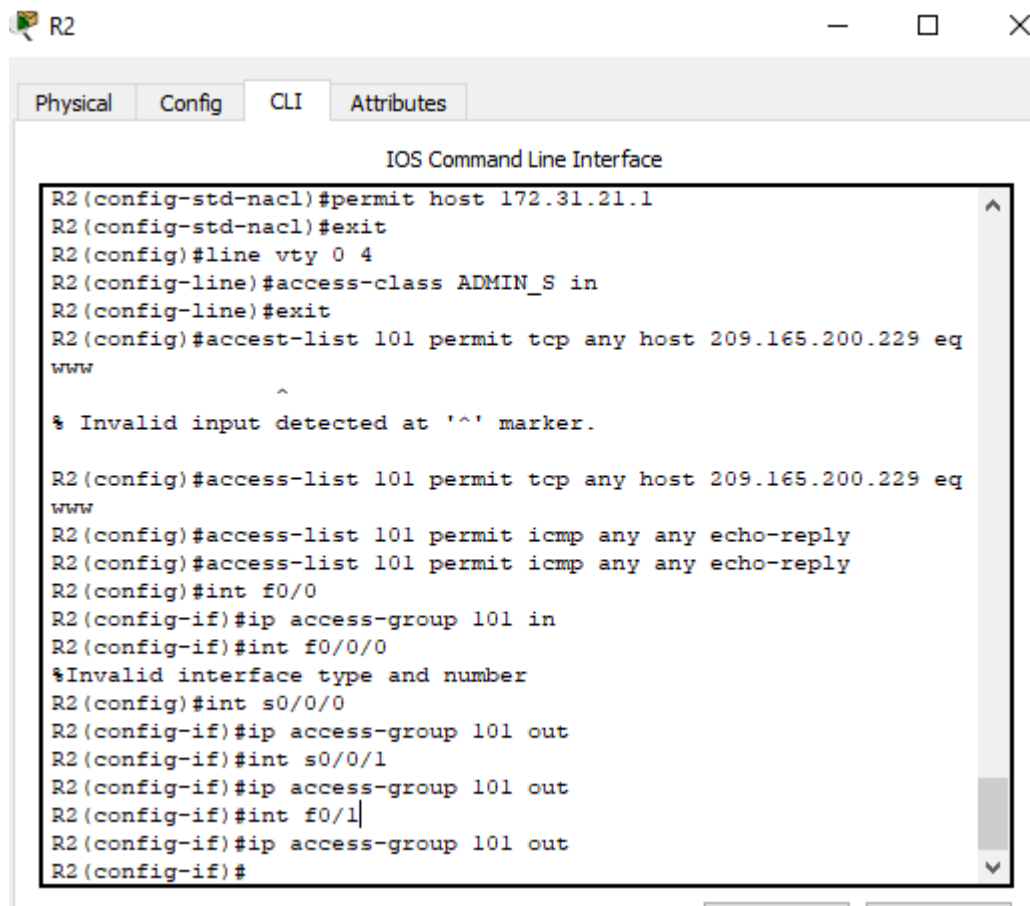
R2(config)#ip acces list
R2(config)#ip access-list standard ADMIN_S
R2(config-std-nacl)#permit host 172.31.21.1
R2(config-std-nacl)#exit
R2(config)#line vty 0 4

R2(config-line)#access-class ADMIN_S in

```
R2 — □ ✕

Physical   Config   CLI   Attributes

                    IOS Command Line Interface

R2(config)#ip nat inside source static 10.10.10.10
209.165.200.229
R2(config)#int f0/0
R2(config-if)#ip nat out
R2(config-if)#ip nat outside
R2(config-if)#int f0/1
R2(config-if)#ip nat inside
R2(config-if)#
R2(config-if)#access-list permit 192.168.30.0 0.0.0.255
                        ^
% Invalid input detected at '^' marker.

R2(config-if)#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)#ip nat pool INTERNET 209.165.200.225 209.165.200.228
netmask 255.255.255.248
R2(config)#ip nat inside source list 1 pool INTERNET
R2(config)#ip acces list
R2(config)#ip access-list standard ADMIN_S
R2(config-std-nacl)#permit host 172.31.21.1
R2(config-std-nacl)#exit
R2(config)#line vty 0 4
R2(config-line)#access-class ADMIN_S in
R2(config-line)#

Ctrl+F6 to exit CLI focus          Copy      Paste
```

R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq www
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#int f0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#int f0/0/0
%Invalid interface type and number
R2(config)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#int f0/1
R2(config-if)#ip access-group 101 out

R2(config-if)#

```
R2                                              —    □    ✕

 Physical   Config   CLI   Attributes

                   IOS Command Line Interface

R2(config-std-nacl)#permit host 172.31.21.1
R2(config-std-nacl)#exit
R2(config)#line vty 0 4
R2(config-line)#access-class ADMIN_S in
R2(config-line)#exit
R2(config)#accest-list 101 permit tcp any host 209.165.200.229 eq
www

                     ^
% Invalid input detected at '^' marker.

R2(config)#access-list 101 permit tcp any host 209.165.200.229 eq
www
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#access-list 101 permit icmp any any echo-reply
R2(config)#int f0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#int f0/0/0
%Invalid interface type and number
R2(config)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#int f0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#
```
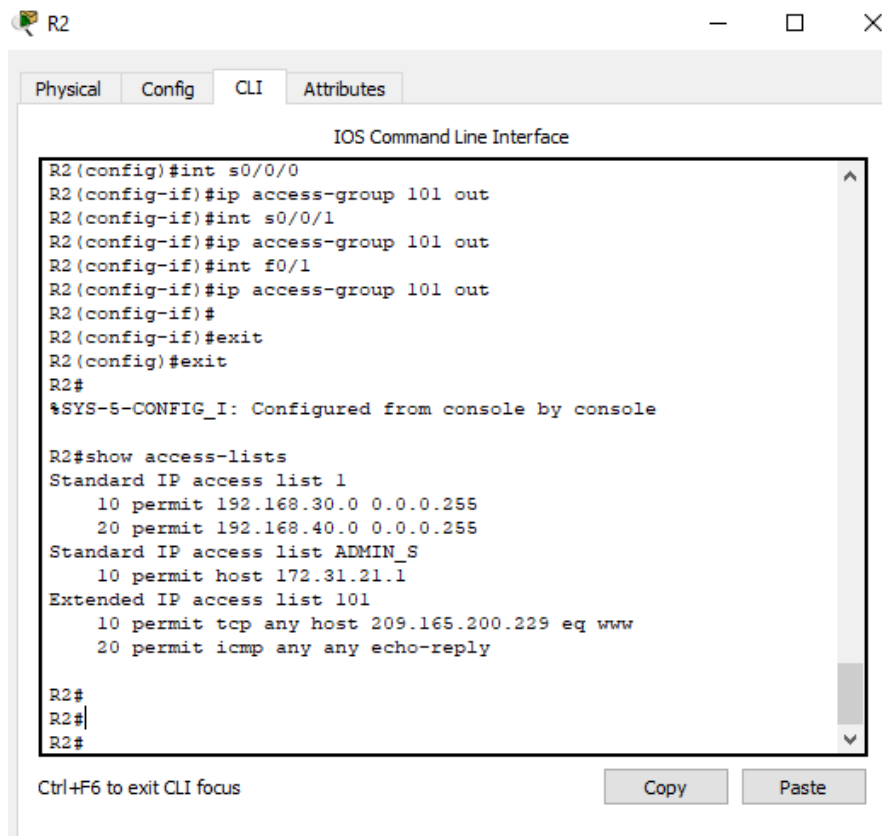
Procesos de ping

R2#show access-lists
Standard IP access list 1
10 permit 192.168.30.0 0.0.0.255
20 permit 192.168.40.0 0.0.0.255
Standard IP access list ADMIN_S
10 permit host 172.31.21.1
Extended IP access list 101
10 permit tcp any host 209.165.200.229 eq www

20 permit icmp any any echo-reply

R2

Physical | Config | CLI | Attributes
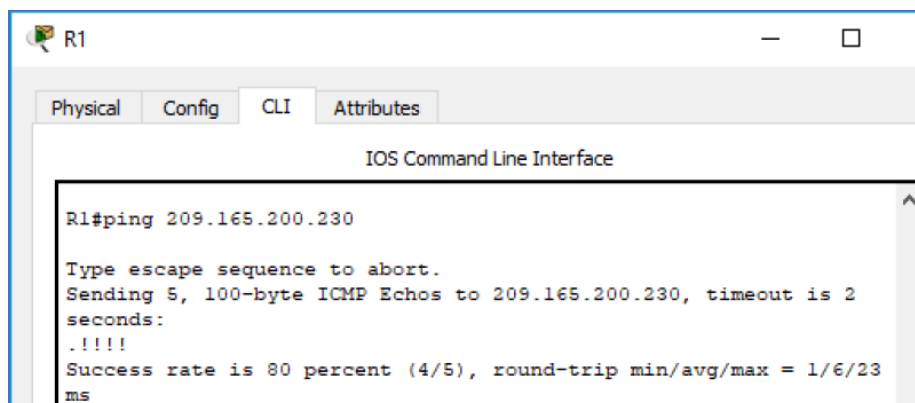
IOS Command Line Interface

```
R2(config)#int s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#int s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#int f0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show access-lists
Standard IP access list 1
    10 permit 192.168.30.0 0.0.0.255
    20 permit 192.168.40.0 0.0.0.255
Standard IP access list ADMIN_S
    10 permit host 172.31.21.1
Extended IP access list 101
    10 permit tcp any host 209.165.200.229 eq www
    20 permit icmp any any echo-reply

R2#
R2#
R2#
```

Ctrl+F6 to exit CLI focus   Copy   Paste

R1

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
R1#ping 209.165.200.230

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.230, timeout is 2
seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 1/6/23
ms
```

CONCLUSIONES

La presente actividad, nos permitió poner en práctica los conocimientos adquiridos en Packet Tracer, para los módulos de CCNA 1 y CCNA 2, durante el desarrollo pudimos configurar diferentes dispositivos que integran una red, dentro de los cuales tenemos SW, Routers, PC, Servidores, y diferentes conectores para siempre establecer la mejor topología, también se practicaron temas relacionados con asignación de direcciones IPs a cada uno de los equipos de la red, Creacion de Vlans y pruebas de conectividad efectiva que se fueron realizando en cada uno de los escenarios.

Sin duda el aprendizaje adquirido será importante para nuestro desempeño en el campo profesional como ingenieros de sistemas.

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https://staticcourseassets.s3.amazonaws.com/RSE503/es/index.html#11.0