

**Diplomado De Profundización Cisco (Diseño E Implementación De
Soluciones Integradas LAN / WAN)**

Prueba de habilidades CCNA

Entregado por:

Maria Magaly Prieto Alvarez

Código: 65500329

Tutor:

Nilson Albeiro Ferreira Manzanares

Grupo:

203092_16

Universidad Nacional Abierta y a Distancia – UNAD

Programa de Ingeniería de Sistemas

Ceade Ibagué

Junio de 2018

Resumen

Esta evaluación denominada “Prueba de habilidades prácticas” forma parte del Diplomado de profundización como requisito de grado de Ingeniería de Sistemas de la universidad Abierta y a Distancia “UNAD”. Por medio de la herramienta Cisco Packet Tracer que es un simulador donde podemos poner práctica todos los conocimientos ya que cuenta con una estructura que simula la realidad de las redes.

Se describen tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde se configuran IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario. Topología De Red, los protocolos de enrutamiento OSPFv2, configuración de los routers, configurar VLANs, puertos troncales, puertos de acceso, encapsulamiento, direcciones IP a los Switches acorde a los lineamientos. Como resultado final después de hacer todo que nos solicita la evaluación se verifica los procesos de comunicación y re direccionamiento de tráfico en los routers mediante su uso.

Abstract

This evaluation called "Test of practical skills" is part of the deepening Diploma as a requirement of Systems Engineering degree of Open and Distance University "UNAD". Through the Cisco Packet Tracer tool that a simulator where we can put all the knowledge practices since it has a structure that simulates the reality of the networks.

Three branches are described distributed in the cities of Bogotá, Medellín and Bucaramanga, where IP is configured according to the network topology for each of the devices that form part of the Network Topology scenario, the OSPFv2 routing protocol, configuration of the routers, configure VLANs, trunk ports, access ports, encapsulation, IP addresses to the switches according to the guidelines. As a result, after doing everything requested by the evaluation, we verify the communication processes and redirect traffic in the routers through their use

Tabla De Contenido

Introducción	5
Objetivos	6
1- Descripción del escenario propuesto para la prueba de habilidades	
2- Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario.	8
1.1 Topología De Red	8
3- Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:	17
4- Visualizar tablas de enrutamiento y routers conectados por OSPFv2	20
5- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface	22
6- Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.	22
7- Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida.	23
8- En el Switch 3 deshabilitar DNS Lookup	24
9- Asignar direcciones IP a los Switches acorde a los lineamientos.	25
10- Desactivar todas las interfaces que no sean utilizadas en el esquema de red.	27
11- Implement DHCP and NAT for IPv4	30
12- Configurar R1 como servidor DHCP para las VLANs 30 y 40. ¡Error! Marcador no definido.	
13- Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas.	31
14- Configurar NAT en R2 para permitir que los host puedan salir a internet	34
15- 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.	35
16- Verificar procesos de comunicación y re direccionamiento de tráfico en los routers mediante el uso	37

Introducción

Hoy en día, el avance tecnológico ha ido cambiando alrededor de nuestras vidas cotidianas y laborales, la capacidad de acceder a internet, ya no está limitada para acceder a oficinas físicas, ubicaciones geográficas o en su defecto en zonas horarias, gracias a los avances tecnológicos los empleados, empresarios o cualquier tipo de persona, puede acceder a los recursos desde cualquier lugar del mundo, donde encontrara la información disponible para su posterior consulta en los distintos dispositivos existentes con conexión a internet.

El presente informe trata sobre la evaluación denominada “Prueba de habilidades prácticas”, forma parte de las actividades evaluativas del Diplomado de Profundización CCNA, la cual busca identificar el grado de desarrollo de competencias y habilidades que fueron adquiridas a lo largo del diplomado y a través de la cual se pondrá a prueba los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.

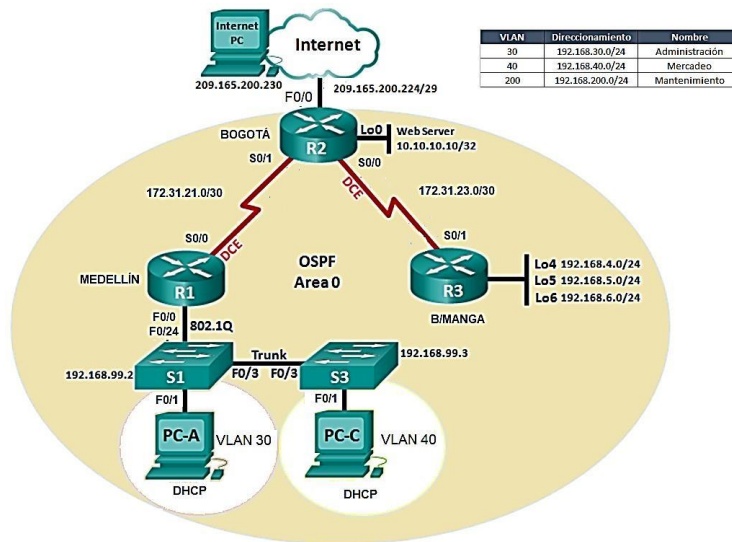
Objetivos

- Realizar la “Prueba de habilidades prácticas”, del Diplomado de Profundización CCNA, y demostrar nuestros conocimientos en práctica y habilidades en el manejo de CISCO
- Identificar los niveles de comprensión y solución de problemas relacionados con diversos aspectos de Networking.
- Diseñar una topología de red de acuerdo a necesidades específicas: como cantidad de host, distancia, direccionamiento, tipos de dispositivos y conexiones.

1- Descripción del escenario propuesto para la prueba de habilidades

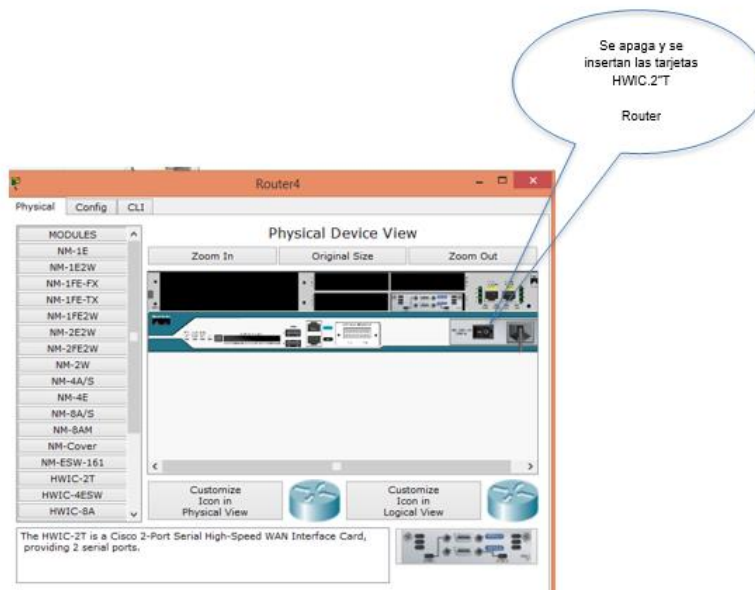
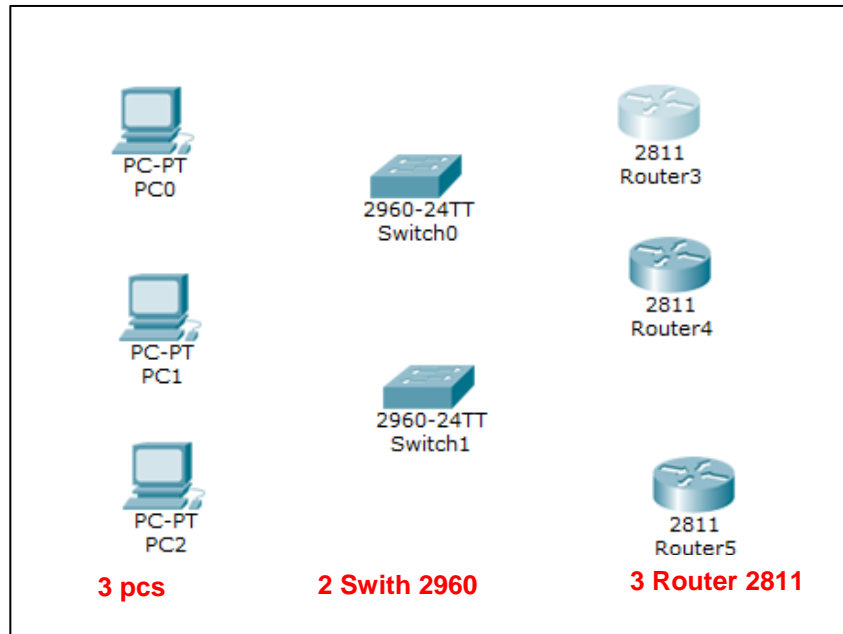
Escenario: Una empresa de Tecnología posee tres sucursales distribuidas en las ciudades de Bogotá, Medellín y Bucaramanga, en donde el estudiante será el administrador de la red, el cual deberá configurar e interconectar entre sí cada uno de los dispositivos que forman parte del escenario, acorde con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

Topología de red

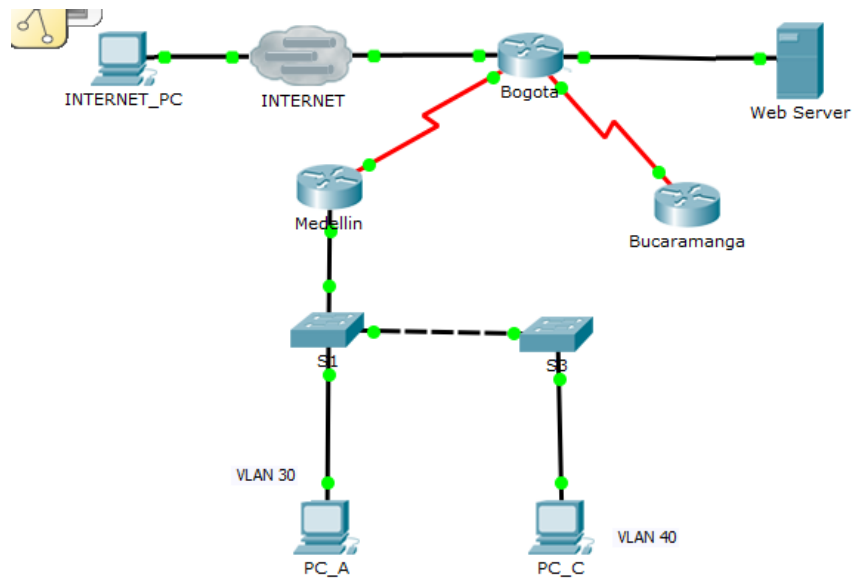


- 2- Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario.

Topología De Red



Topologia



Configuración PC Internet

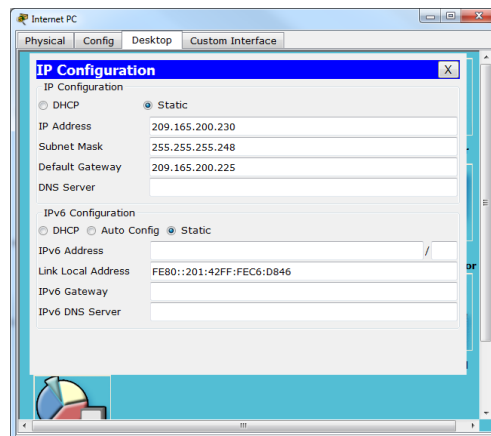


Tabla de direccionamiento IP para los equipos y router

IPS PARA LOS EQUIPOS Y ENLACES					
ENLACE	RED	MASCARA	RANGO/HOSTS	BROADCAST	TIPO
INTERFAZ INTERNET	209.165.200.255/29	255.255.255.248	209.165.200.225 - 209.165.200.200	209.165.200.231	IP PUBLICA CLASE C
ADMINISTRACIÓN VLAN 30	192.168.30.0/25	255.255.255.128	192.168.30.1-192.168.30.2	192.168.30.3	IP PRIVADA CLASE C
MERCADEO VLAN 30	192.168.40.0/25	255.255.255.128	192.168.200.1- 192.168.200.126	192.168.40.127	IP PRIVADA CLASE C
MANTENIMIENTO VLAN 200	192.168.200.0/25	255.255.255.128	192.168.40.1- 192.168.40.127	192.168.200.127	IP PRIVADA CLASE C
WEB SERVER Lo	10.10.10/32	255.255.255.255	10.10.10.10-10.10.10.10	10.10.10.10	IP PRIVADA CLASE A
ENLACE R1-R2	172.31.21.0/30	255.255.255.252	172.31.21.1-172.31.21.2	172.31.21.3	IP PRIVADA CLASE B
ENLACE R2-R3	172.31.23.0/30	255.255.255.252	172.31.23.1-172.31.23.2	172.31.23.3	IP PRIVADA CLASE B
Lo4	192.168.4.0/24	255.255.255.000	192.168.1.1-192.168.4.254	192.168.4.255	IP PRIVADA CLASE C
Lo5	192.168.5.0/24	255.255.255.000	192.168.1.1-192.168.4.255	192.168.5.255	IP PRIVADA CLASE C
Lo6	192.168.6.0/24	255.255.255.000	192.168.6.1-192.168.6.254	192.168.6.255	IP PRIVADA CLASE C
LAN-S1-S2	192.168.99.0/24	255.255.255.000	192.168.99.1- 192.168.99.254	192.168.99.255	IP PRIVADA CLASE C

Configuración Router (R1)

```

R1
Physical Config CLI
IOS Command Line Interface

Cisco CISC01941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router#configure t
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#interfa
R1(config)#interface s0/0/0
R1(config-if)#ip add 172.31.21.1 255.255.255.252
R1(config-if)#
    
```

R1

Physical Config CLI

IOS Command Line Interface

If you require further assistance please contact us by sending email to export@cisco.com.

Cisco CISC01941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]:
% Please answer 'yes' or 'no'.
Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

```
Router>en
Router#configure t
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#
```

Copy Paste

R1

Physical Config CLI

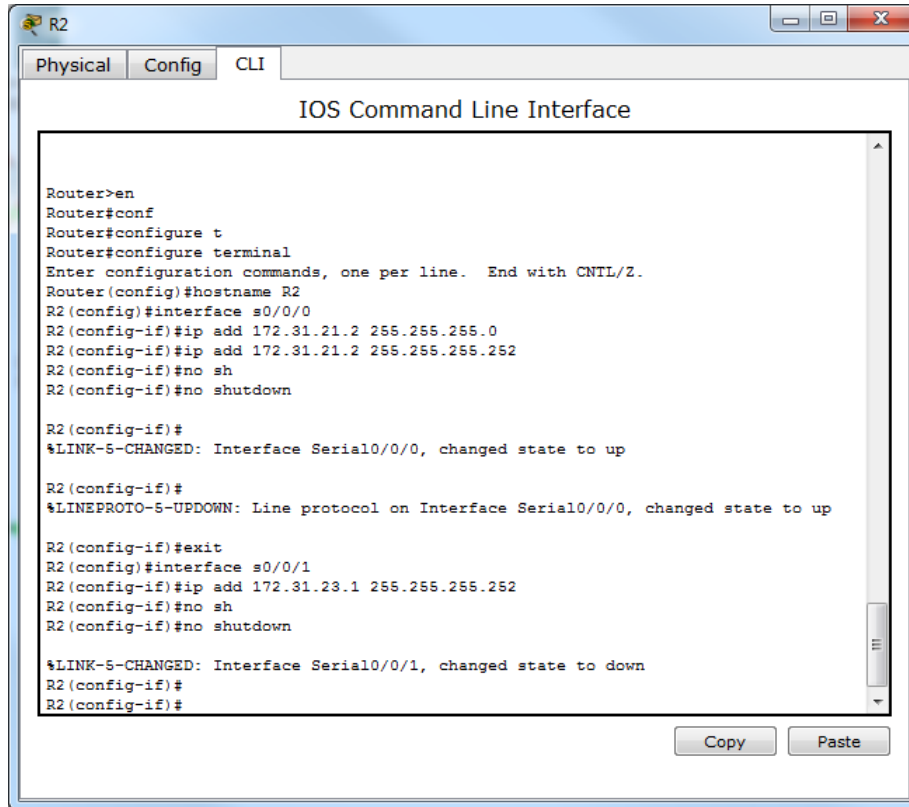
IOS Command Line Interface

```
R1>en
R1#confi
R1#configure t
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface f0/0/0
%Invalid interface type and number
R1(config)#interface s0/0/0
R1(config-if)#ip ospf cost 7500
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

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

Copy Paste

Configuración Router (R2)



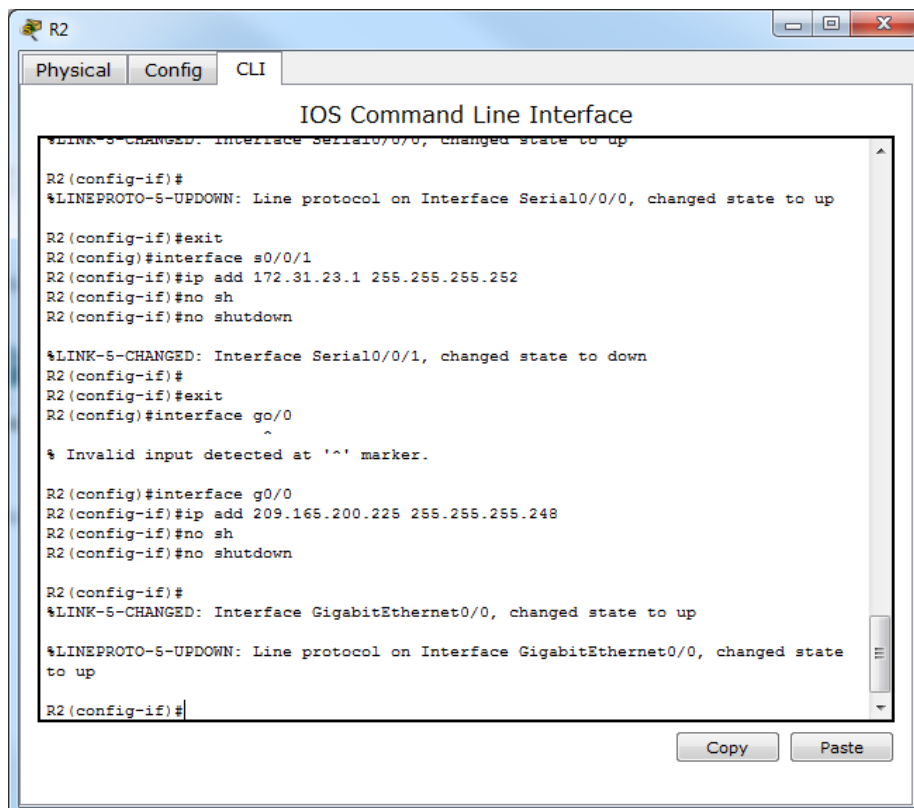
```
Router>en
Router#conf
Router#configure t
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#interface s0/0/0
R2(config-if)#ip add 172.31.21.2 255.255.255.0
R2(config-if)#ip add 172.31.21.2 255.255.255.252
R2(config-if)#no sh
R2(config-if)#no shutdown

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

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

R2(config-if)#exit
R2(config)#interface s0/0/1
R2(config-if)#ip add 172.31.23.1 255.255.255.252
R2(config-if)#no sh
R2(config-if)#no shutdown

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



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

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

R2(config-if)#exit
R2(config)#interface s0/0/1
R2(config-if)#ip add 172.31.23.1 255.255.255.252
R2(config-if)#no sh
R2(config-if)#no shutdown

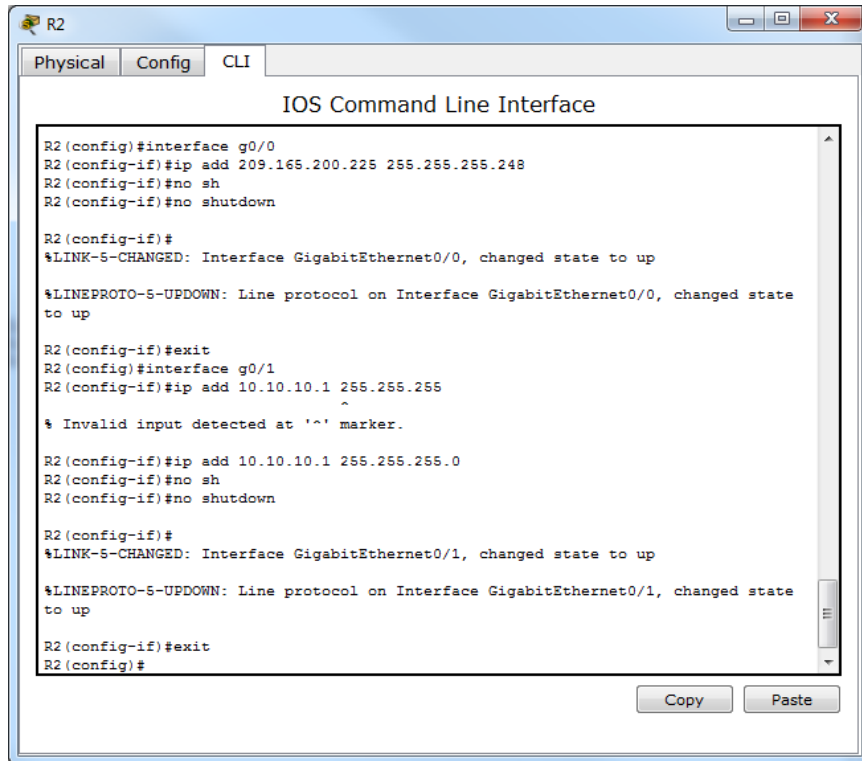
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#
R2(config-if)#exit
R2(config)#interface g0/0
^
% Invalid input detected at '^' marker.

R2(config)#interface g0/0
R2(config-if)#ip add 209.165.200.225 255.255.255.248
R2(config-if)#no sh
R2(config-if)#no shutdown

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

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

R2(config-if)#
```



The screenshot shows the CLI of router R2. The window title is 'R2' and it has tabs for 'Physical', 'Config', and 'CLI'. The main area is titled 'IOS Command Line Interface'. The terminal output shows the configuration of two interfaces: g0/0 and g0/1. Interface g0/0 is configured with IP 209.165.200.225, mask 255.255.255.248, and is shut down. Interface g0/1 is configured with IP 10.10.10.1, mask 255.255.255.0, and is shut down. The terminal shows status messages for link and line protocol changes for both interfaces. The session ends with 'R2(config)#'.

```
R2 (config)#interface g0/0
R2 (config-if)#ip add 209.165.200.225 255.255.255.248
R2 (config-if)#no sh
R2 (config-if)#no shutdown

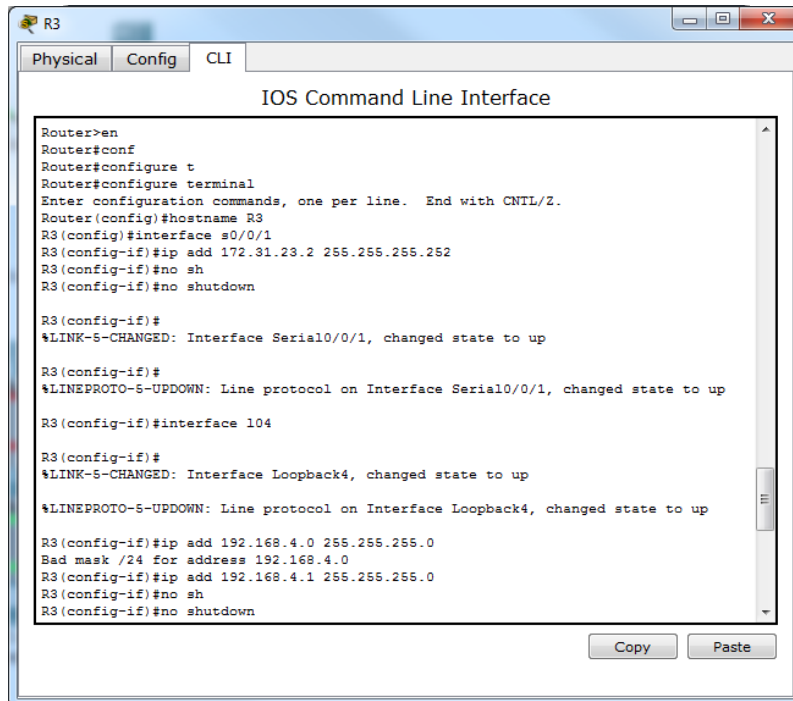
R2 (config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

R2 (config-if)#exit
R2 (config)#interface g0/1
R2 (config-if)#ip add 10.10.10.1 255.255.255.0
R2 (config-if)#no sh
R2 (config-if)#no shutdown

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

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

Configuración Router (R3)



The screenshot shows the CLI of router R3. The window title is 'R3' and it has tabs for 'Physical', 'Config', and 'CLI'. The main area is titled 'IOS Command Line Interface'. The terminal output shows the configuration of three interfaces: s0/0/1 and two loopback interfaces (l04 and l05). Interface s0/0/1 is configured with IP 172.31.23.2, mask 255.255.255.252, and is shut down. Loopback interface l04 is configured with IP 192.168.4.0, mask 255.255.255.0. Loopback interface l05 is configured with IP 192.168.4.1, mask 255.255.255.0, and is shut down. The terminal shows status messages for link and line protocol changes for the serial and loopback interfaces. The session ends with 'R3(config-if)#'.

```
Router>en
Router#conf
Router#configure t
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router (config)#hostname R3
R3 (config)#interface s0/0/1
R3 (config-if)#ip add 172.31.23.2 255.255.255.252
R3 (config-if)#no sh
R3 (config-if)#no shutdown

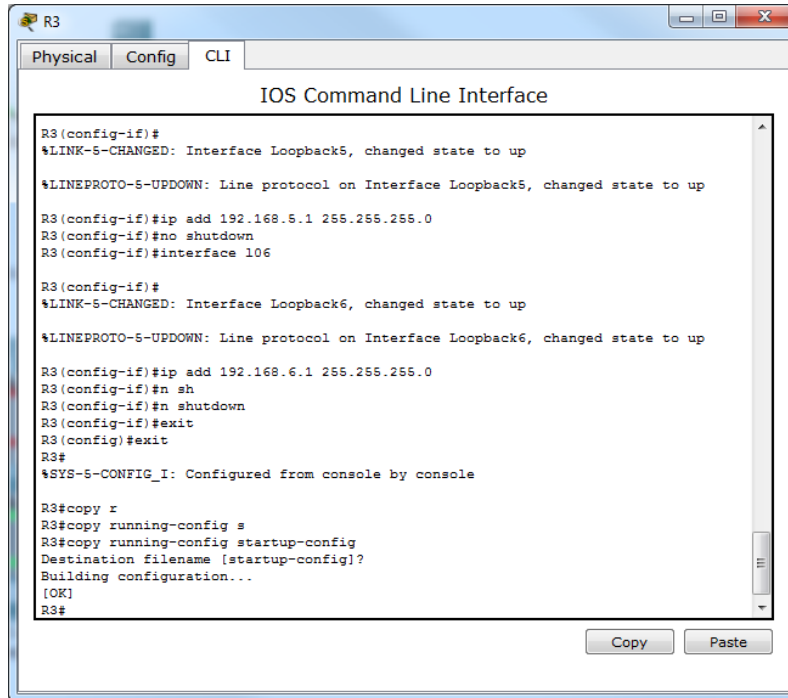
R3 (config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

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

R3 (config-if)#interface l04
R3 (config-if)#
%LINK-5-CHANGED: Interface Loopback4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback4, changed state to up

R3 (config-if)#ip add 192.168.4.0 255.255.255.0
Bad mask /24 for address 192.168.4.0
R3 (config-if)#ip add 192.168.4.1 255.255.255.0
R3 (config-if)#no sh
R3 (config-if)#no shutdown

R3 (config-if)#
```

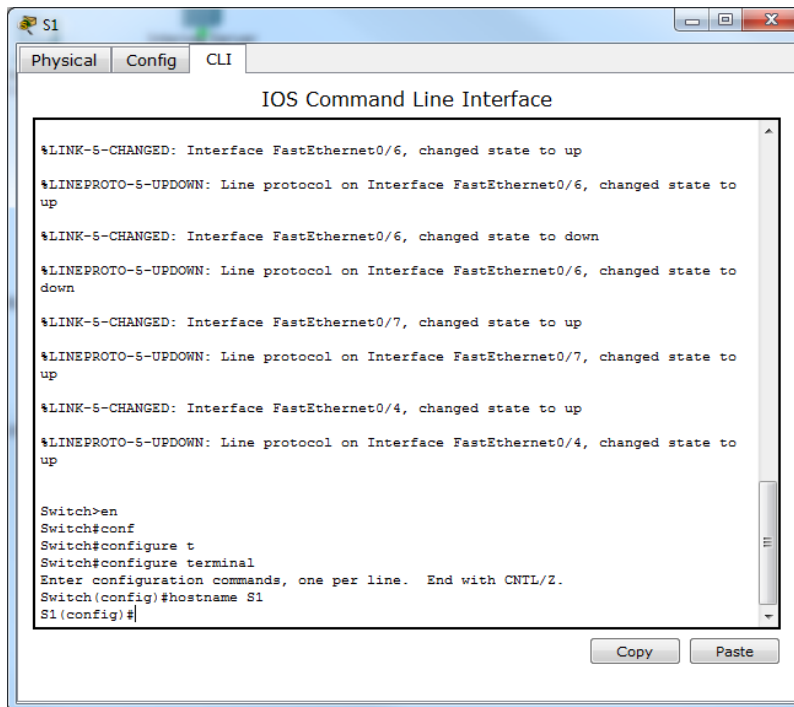


The screenshot shows a window titled 'R3' with tabs for 'Physical', 'Config', and 'CLI'. The main area is titled 'IOS Command Line Interface' and contains the following text:

```
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 shutdown
R3(config-if)#interface 106
R3(config-if)#
%LINK-5-CHANGED: Interface Loopback6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up
R3(config-if)#ip add 192.168.6.1 255.255.255.0
R3(config-if)#n sh
R3(config-if)#n shutdown
R3(config-if)#exit
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console
R3#copy r
R3#copy running-config s
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#
```

At the bottom right of the window, there are 'Copy' and 'Paste' buttons.

Configuración Switch (S1)



The screenshot shows a window titled 'S1' with tabs for 'Physical', 'Config', and 'CLI'. The main area is titled 'IOS Command Line Interface' and contains the following text:

```
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/7, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
Switch>en
Switch#conf
Switch#configure t
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#
```

At the bottom right of the window, there are 'Copy' and 'Paste' buttons.

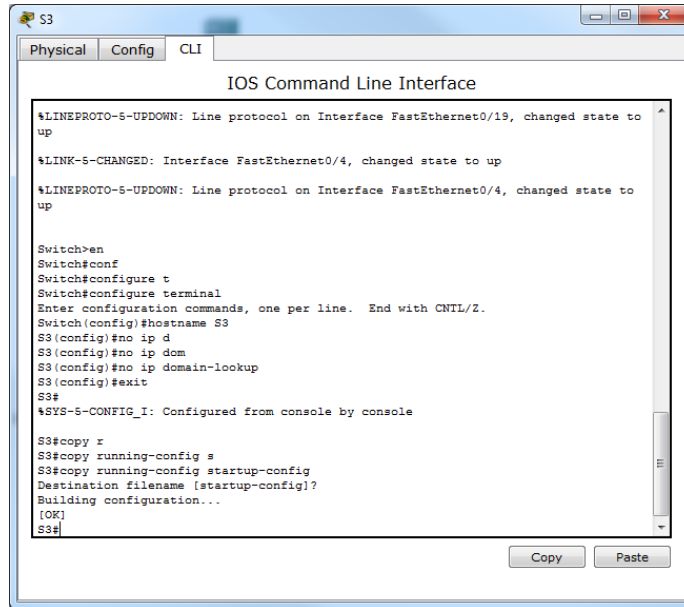
```
Switch>
Switch>en
Switch#conf
Switch#configure t
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
copy r
S1#copy running-config s
S1#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
S1#
```

Configuración Switch (S3)

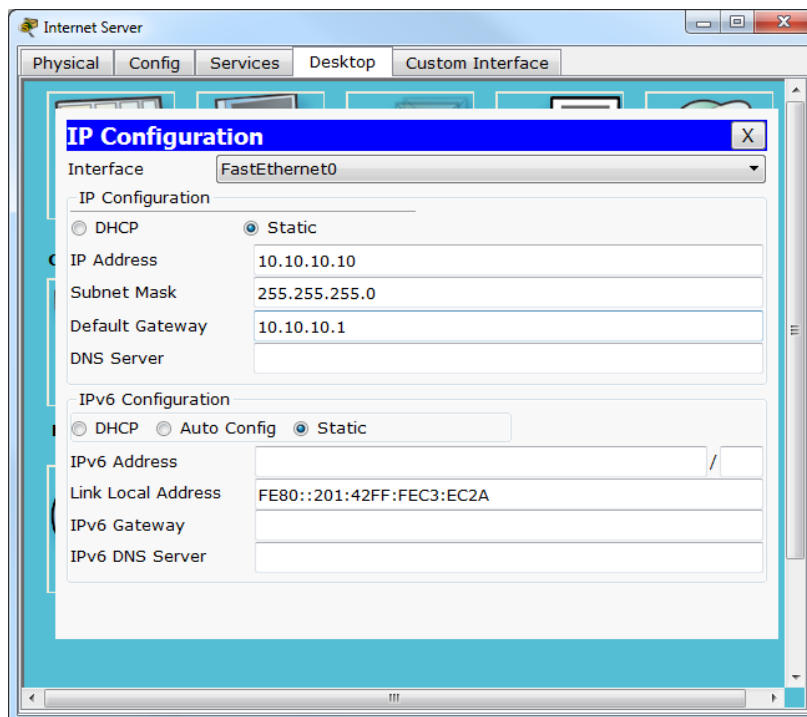
```
Cisco IOS Software, C2960 Software (C2960-LANBASE-M), Version 12.2(25)FX, RELEASE SOFTWARE (fc1)
Copyright (c) 1986-2005 by Cisco Systems, Inc.
Compiled Wed 12-Oct-05 22:05 by pt_team

Press RETURN to get started!

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



Configuración Internet Server

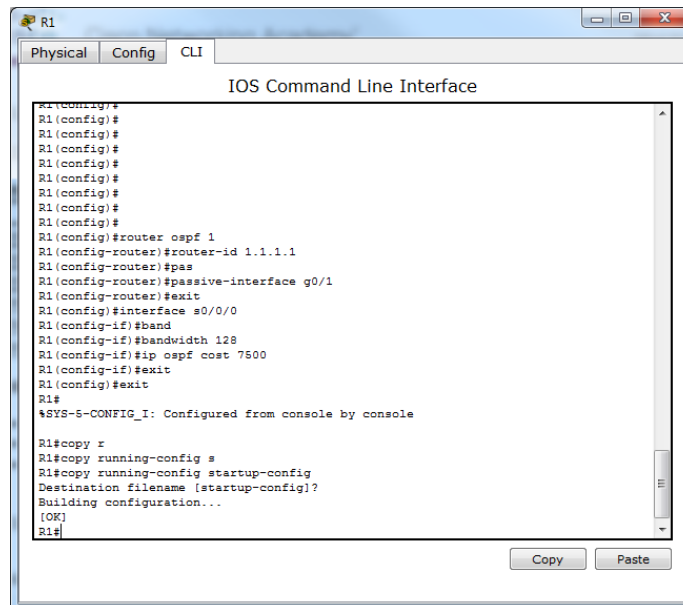


3- Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 área 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	2.2.2.2
Router ID R3	3.3.3.3
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	128 Kb/s
Ajustar el costo en la métrica de S0/0 a	7500

Configuración Router (R1)



```
R1
Physical Config CLI
IOS Command Line Interface
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)#
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#pas
R1(config-router)#passive-interface g0/1
R1(config-router)#exit
R1(config)#interface s0/0/0
R1(config-if)#band
R1(config-if)#bandwidth 128
R1(config-if)#ip ospf cost 7500
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

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

```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#
02:06:55: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/0 from LOADING to FULL, Loading Done

R2(config-router)#pas
R2(config-router)#passive-interface g0/1
R2(config-router)#exit
R2(config)#interface s0/0/0
R2(config-if)#bandwidth 128
R2(config-if)#ip ospf cost 7500
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

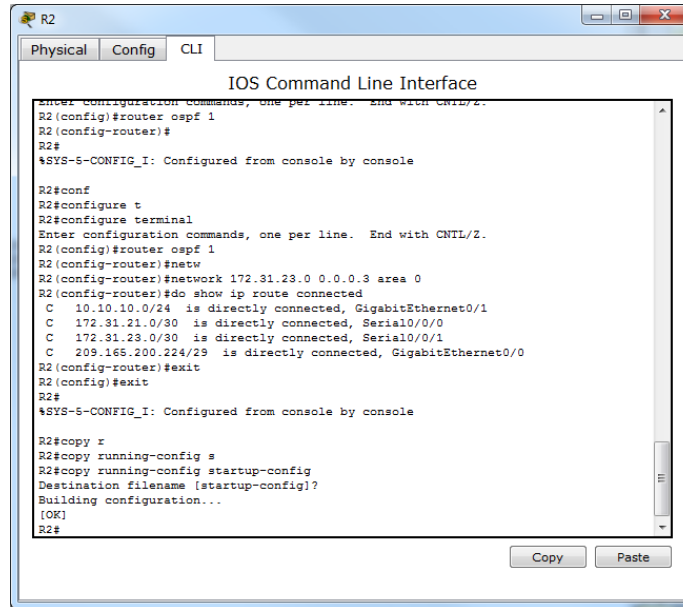
R2#copy
R2#copy r
R2#copy running-config s
R2#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R2#
```

Configuración Router (R2)

```
R2#en
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

R2>en
R2#conf
R2#configure t
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#netw
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#
02:06:55: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/0/0 from LOADING to FULL, Loading Done

R2(config-router)#
```



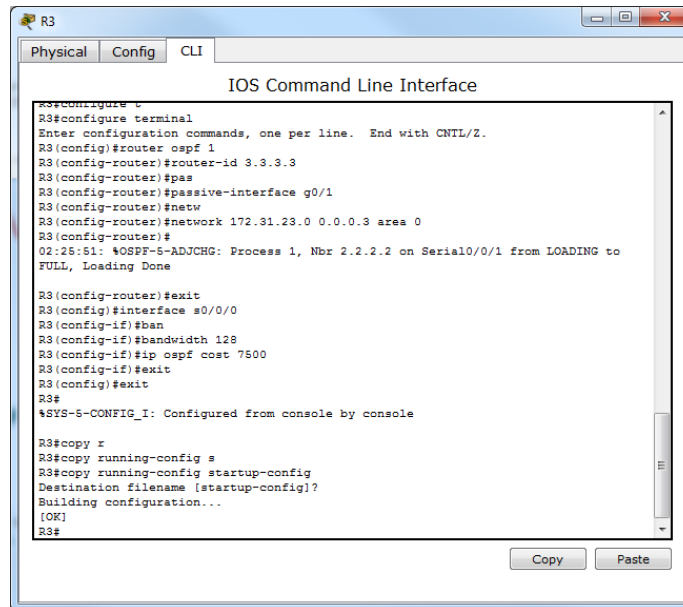
The screenshot shows the CLI window for router R2. The window title is "R2" and it has tabs for "Physical", "Config", and "CLI". The main content is titled "IOS Command Line Interface". The terminal output shows the following commands and their results:

```
R2 (config)#router ospf 1
R2 (config-router)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#conf
R2#configure t
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2 (config)#router ospf 1
R2 (config-router)#netw
R2 (config-router)#network 172.31.23.0 0.0.0.3 area 0
R2 (config-router)#do show ip route connected
C 10.10.10.0/24 is directly connected, GigabitEthernet0/1
C 172.31.21.0/30 is directly connected, Serial0/0/0
C 172.31.23.0/30 is directly connected, Serial0/0/1
C 209.166.200.224/29 is directly connected, GigabitEthernet0/0
R2 (config-router)#exit
R2 (config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

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

Configuración Router (R3)



The screenshot shows the CLI window for router R3. The window title is "R3" and it has tabs for "Physical", "Config", and "CLI". The main content is titled "IOS Command Line Interface". The terminal output shows the following commands and their results:

```
R3#configure t
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3 (config)#router ospf 1
R3 (config-router)#router-id 3.3.3.3
R3 (config-router)#pas
R3 (config-router)#passive-interface g0/1
R3 (config-router)#netw
R3 (config-router)#network 172.31.23.0 0.0.0.3 area 0
R3 (config-router)#
02:25:51: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from LOADING to FULL, Loading Done
R3 (config-router)#exit
R3 (config)#interface s0/0/0
R3 (config-if)#ban
R3 (config-if)#bandwidth 128
R3 (config-if)#ip ospf cost 7500
R3 (config-if)#exit
R3 (config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#copy r
R3#copy running-config s
R3#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
R3#
```

```
R3
Physical Config CLI
IOS Command Line Interface

2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

Press RETURN to get started!

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

R3>en
R3#conf
R3#configure t
R3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#router-id 3.3.3.3
R3(config-router)#pas
R3(config-router)#passive-interface g0/1
R3(config-router)#netw
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#
02:25:51: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from LOADING to FULL, Loading Done
R3(config-router)#
```

4- Visualizar tablas de enrutamiento y routers conectados por OSPFv2

Router (R3)

```
R2
Physical Config CLI
IOS Command Line Interface

R2 CON0 is now available

Press RETURN to get started.

R2>en
R2#show ip ospf nei
R2#show ip ospf neighbor

Neighbor ID    Pri  State           Dead Time   Address        Interface
1.1.1.1         0  FULL/ -         00:00:39   172.31.21.1   Serial0/0/0
3.3.3.3         0  FULL/ -         00:00:39   172.31.23.2   Serial0/0/1
R2#
```

Router (R3)

R1

Physical Config CLI

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.30, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.33, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.40, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.200, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0 from LOADING to FULL, Loading Done

R1>en
R1#show ip ospf nei
R1#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	0	FULL/ -	00:00:37	172.31.21.2	Serial0/0/0

R1#

Copy Paste

Router (R3)

R3

Physical Config CLI

IOS Command Line Interface

```
http://www.cisco.com/web/export/cli/pdf/0001/30091.html
If you require further assistance please contact us by sending email to export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
256K bytes of non-volatile configuration memory.
249956K bytes of ATA System CompactFlash 0 (Read/Write)

Press RETURN to get started!

%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
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/1 from LOADING to FULL, Loading Done

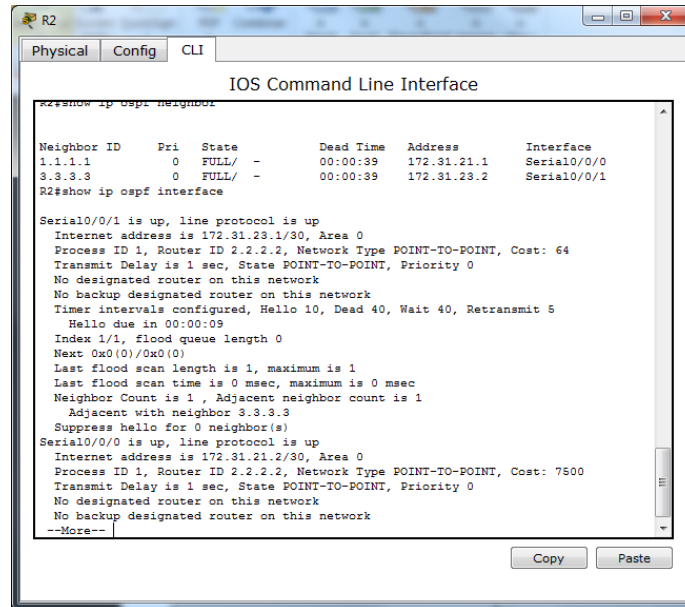
R3>show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
2.2.2.2	0	FULL/ -	00:00:31	172.31.23.1	Serial0/0/1

R3>

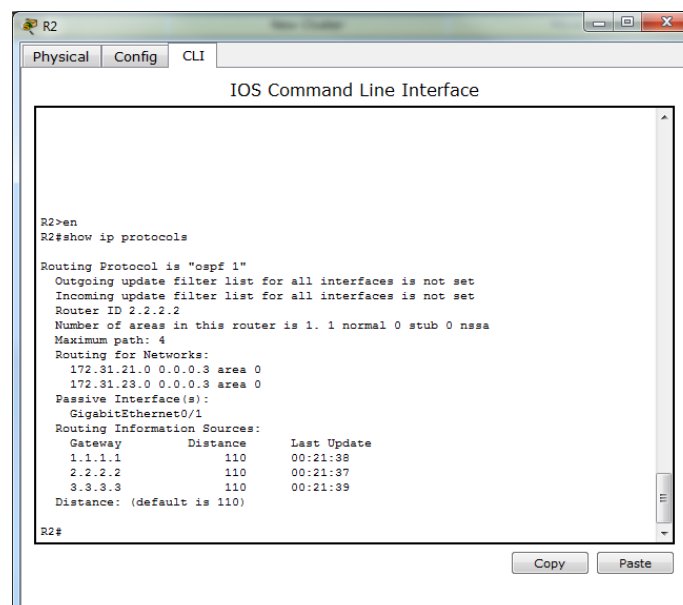
Copy Paste

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



```
R2
Physical Config CLI
IOS Command Line Interface
R2>show ip ospf neighbor
Neighbor ID  Pri  State           Dead Time  Address        Interface
1.1.1.1      0  FULL/ -         00:00:39   172.31.21.1   Serial0/0/0
3.3.3.3      0  FULL/ -         00:00:39   172.31.23.2   Serial0/0/1
R2#show ip ospf interface
Serial0/0/1 is up, line protocol is up
Internet address is 172.31.23.1/30, Area 0
Process ID 1, Router ID 2.2.2.2, 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 00:00:09
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 3.3.3.3
Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.21.2/30, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500
Transmit Delay is 1 sec, State POINT-TO-POINT, Priority 0
No designated router on this network
No backup designated router on this network
--More--
Copy Paste
```

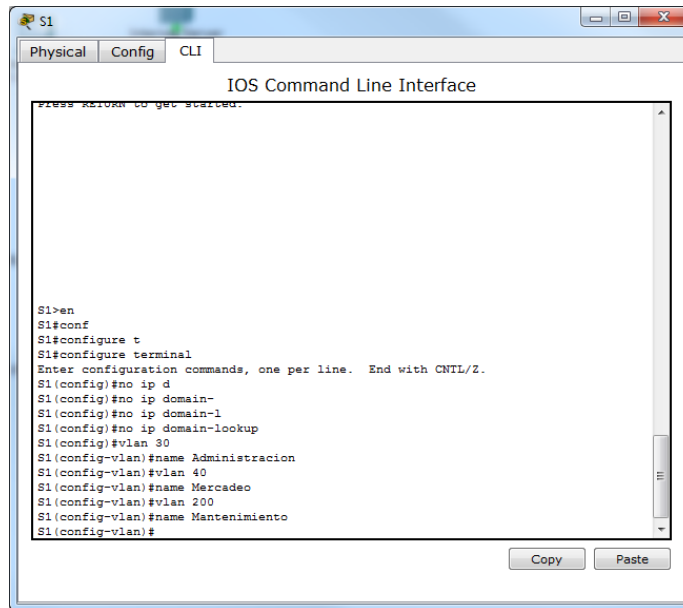
- 6- Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.



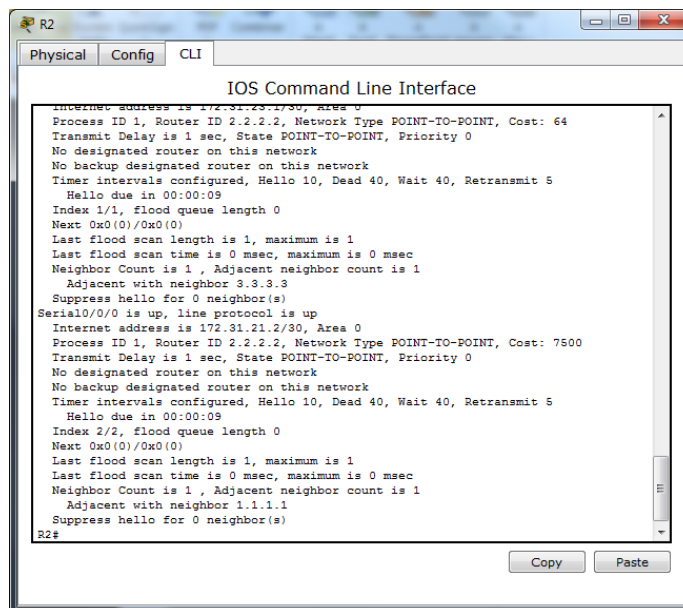
```
R2
Physical Config CLI
IOS Command Line Interface
R2>en
R2#show ip protocols
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 2.2.2.2
  Number of areas in this router is 1. 1 normal 0 stub 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
  Passive Interface(s):
    GigabitEthernet0/1
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1          110          00:21:38
    2.2.2.2          110          00:21:37
    3.3.3.3          110          00:21:39
  Distance: (default is 110)
R2#
Copy Paste
```

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

Switch (1)

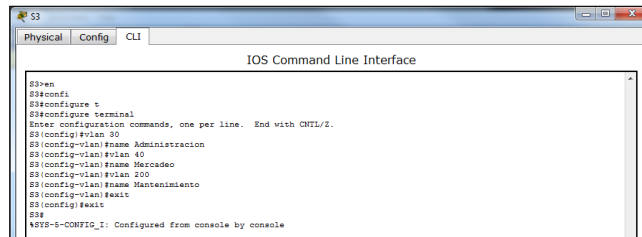


```
S1>en
S1#conf
S1#configure t
S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#no ip d
S1(config)#no ip domain-
S1(config)#no ip domain-1
S1(config)#no ip domain-lookup
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#
```



```
Internet address is 172.31.21.2/30, Area 0
Process ID 1, Router ID 2.2.2.2, 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 00:00:09
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 3.3.3.3
Suppress hello for 0 neighbor(s)
Serial0/0/0 is up, line protocol is up
Internet address is 172.31.21.2/30, Area 0
Process ID 1, Router ID 2.2.2.2, Network Type POINT-TO-POINT, Cost: 7500
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 00:00:09
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 1.1.1.1
Suppress hello for 0 neighbor(s)
R2#
```

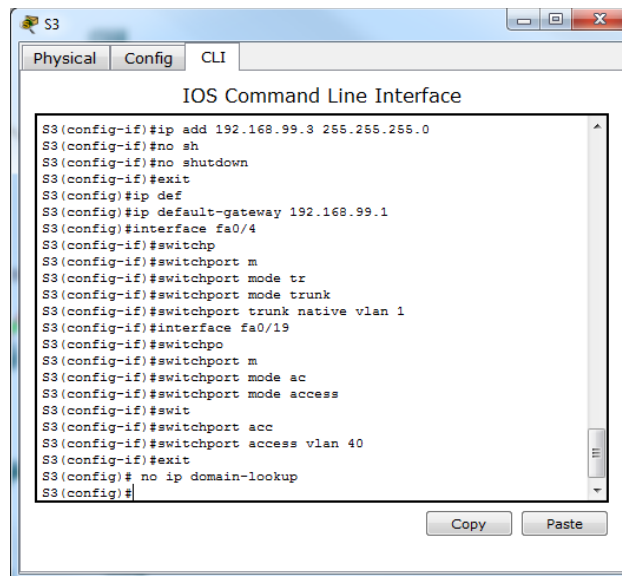
Switch (S3)



```
S3>en
S3#confi
S3#configure t
S3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S3 (config)#vlan 90
S3 (config-vlan)#name Administracion
S3 (config-vlan)#vlan 40
S3 (config-vlan)#name Mercedes
S3 (config-vlan)#vlan 200
S3 (config-vlan)#name Mantenimiento
S3 (config-vlan)#exit
S3 (config)#exit
S3#
*SYS-5-CONFIG_I: Configured from console by console
```

8- En el Switch 3 deshabilitar DNS Lookup

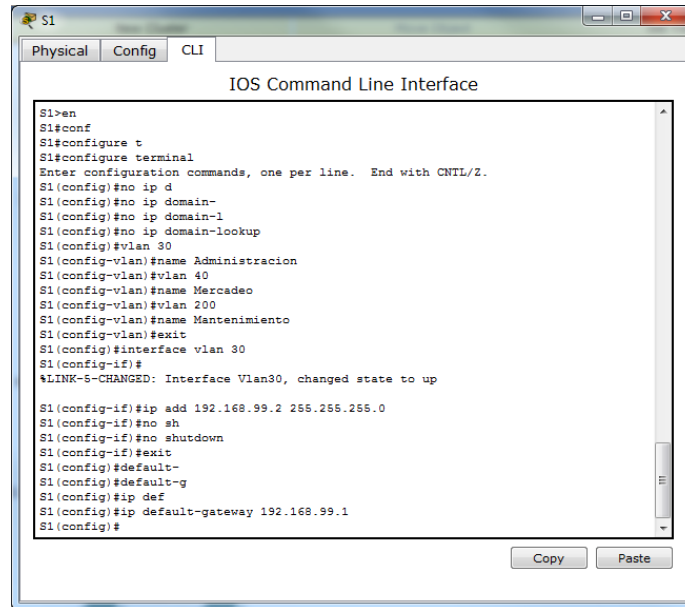
Switch (S3)



```
S3 (config-if)#ip add 192.168.99.3 255.255.255.0
S3 (config-if)#no sh
S3 (config-if)#no shutdown
S3 (config-if)#exit
S3 (config)#ip def
S3 (config)#ip default-gateway 192.168.99.1
S3 (config)#interface fa0/4
S3 (config-if)#switchp
S3 (config-if)#switchport m
S3 (config-if)#switchport mode tr
S3 (config-if)#switchport mode trunk
S3 (config-if)#switchport trunk native vlan 1
S3 (config-if)#interface fa0/19
S3 (config-if)#switchpo
S3 (config-if)#switchport m
S3 (config-if)#switchport mode ac
S3 (config-if)#switchport mode access
S3 (config-if)#swit
S3 (config-if)#switchport acc
S3 (config-if)#switchport access vlan 40
S3 (config-if)#exit
S3 (config)# no ip domain-lookup
S3 (config)#
```

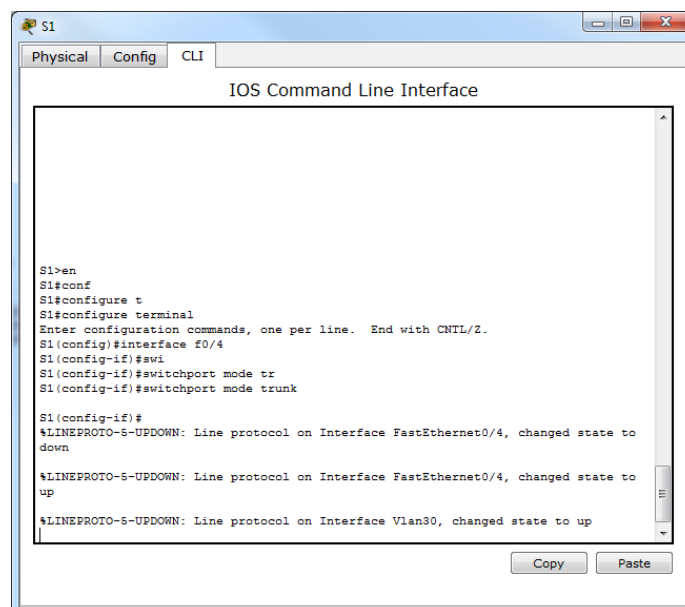

9- Asignar direcciones IP a los Switches acorde a los lineamientos.

Switch (S1)



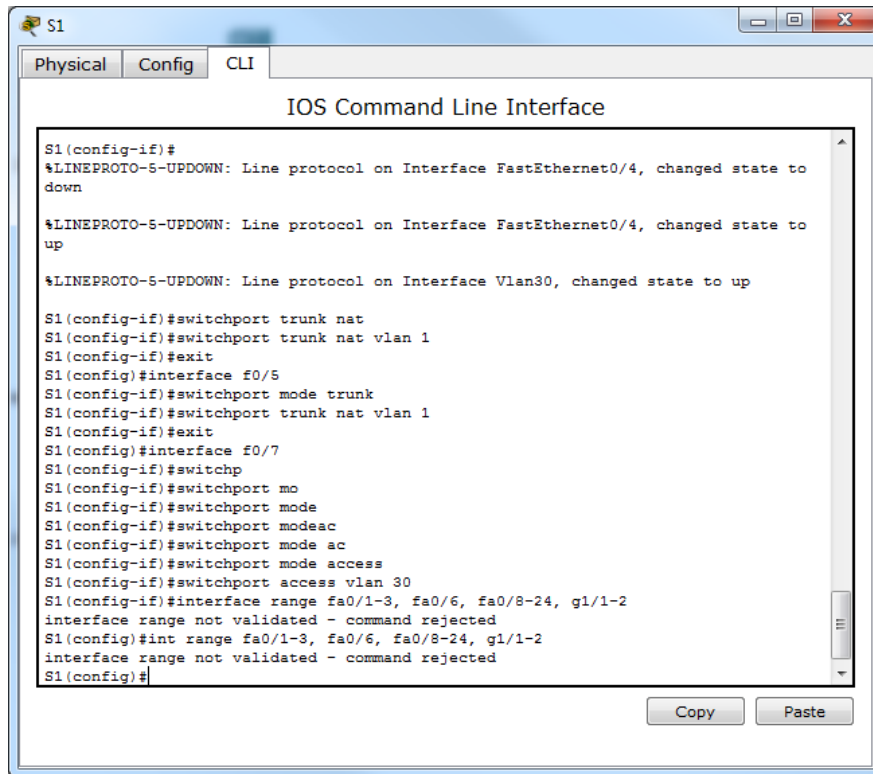
```
S1>en
S1#conf
S1#configure t
S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#no ip d
S1(config)#no ip domain-
S1(config)#no ip domain-1
S1(config)#no ip domain-lookup
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#interface vlan 30
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan30, changed state to up

S1(config-if)#ip add 192.168.99.2 255.255.255.0
S1(config-if)#no sh
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#default-
S1(config)#default-g
S1(config)#ip def
S1(config)#ip default-gateway 192.168.99.1
S1(config)#
```



```
S1>en
S1#conf
S1#configure t
S1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface E0/4
S1(config-if)#swi
S1(config-if)#switchport mode tr
S1(config-if)#switchport mode trunk

S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to
down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to
up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up
```



The screenshot shows a Cisco IOS Command Line Interface window for switch S1. The window has tabs for Physical, Config, and CLI. The CLI tab is active, displaying a series of configuration commands and their outputs. The commands include setting line protocols on Fa0/4 and Vlan30, configuring Fa0/5 and Fa0/7 as trunk ports, and configuring Fa0/1-3, Fa0/6, and Fa0/8-24 as access ports. The outputs show the state changes for the line protocols and the rejection of invalid interface range commands.

```
S1
Physical Config CLI
IOS Command Line Interface

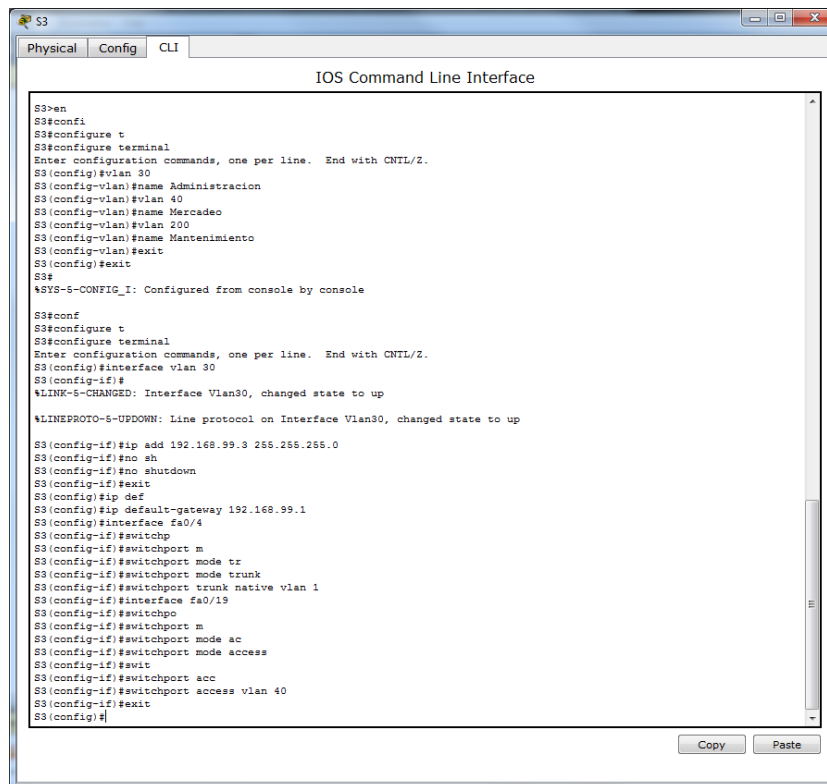
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to
down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to
up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

S1(config-if)#switchport trunk nat
S1(config-if)#switchport trunk nat vlan 1
S1(config-if)#exit
S1(config)#interface f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk nat vlan 1
S1(config-if)#exit
S1(config)#interface f0/7
S1(config-if)#switchp
S1(config-if)#switchport mo
S1(config-if)#switchport mode
S1(config-if)#switchport modeac
S1(config-if)#switchport mode ac
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#interface range fa0/1-3, fa0/6, fa0/8-24, g1/1-2
interface range not validated - command rejected
S1(config)#int range fa0/1-3, fa0/6, fa0/8-24, g1/1-2
interface range not validated - command rejected
S1(config)#
```

Switch (S3)



The screenshot shows a Cisco IOS Command Line Interface window for switch S3. The window has tabs for Physical, Config, and CLI. The CLI tab is active, displaying a series of configuration commands and their outputs. The commands include enabling the console, configuring terminal settings, creating VLANs (Administration, Mercadeo, 200, Mantenimiento), configuring Vlan30 as an access port, and configuring Fa0/4 as a trunk port. The outputs show the state changes for the line protocols and the configuration of the access and trunk ports.

```
S3
Physical Config CLI
IOS Command Line Interface

S3>en
S3#confi
S3#configure t
S3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#vlan 30
S3(config-vlan)#name Administration
S3(config-vlan)#vlan 40
S3(config-vlan)#name Mercadeo
S3(config-vlan)#vlan 200
S3(config-vlan)#name Mantenimiento
S3(config-vlan)#exit
S3(config)#exit
S3#
%SYS-5-CONFIG_I: Configured from console by console

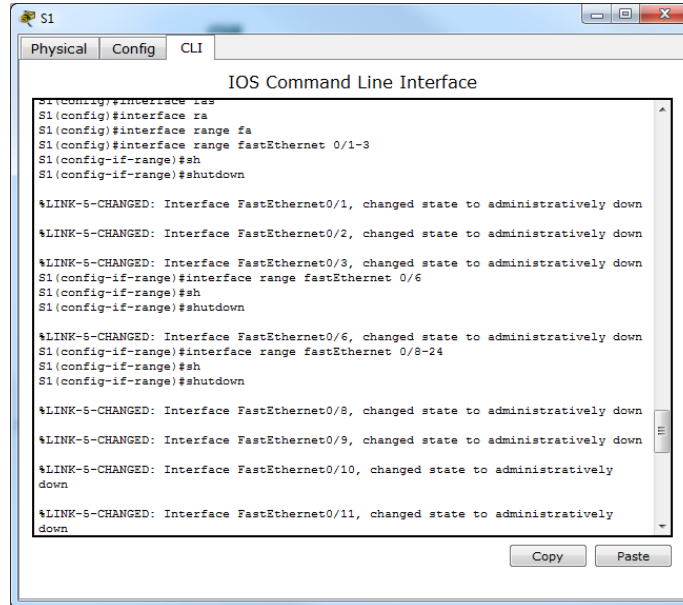
S3#conf
S3#configure t
S3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#interface vlan 30
S3(config-if)#
%LINK-6-CHANGED: Interface Vlan30, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan30, changed state to up

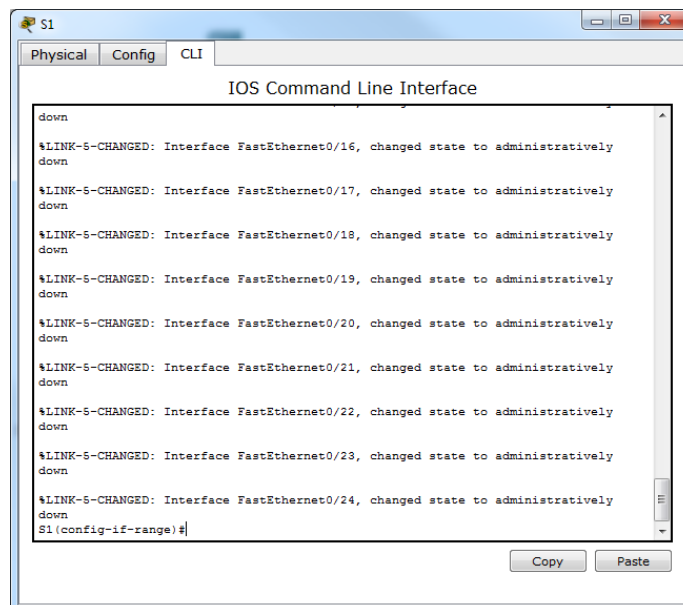
S3(config-if)#ip add 192.168.99.3 255.255.255.0
S3(config-if)#no sh
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip def
S3(config)#ip default-gateway 192.168.99.1
S3(config)#interface fa0/4
S3(config-if)#switchp
S3(config-if)#switchport m
S3(config-if)#switchport mode tr
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface fa0/19
S3(config-if)#switchpo
S3(config-if)#switchport m
S3(config-if)#switchport mode ac
S3(config-if)#switchport mode access
S3(config-if)#switchport mode access
S3(config-if)#switchport acc
S3(config-if)#switchport access vlan 40
S3(config-if)#exit
S3(config)#
```

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

Switch (S1)

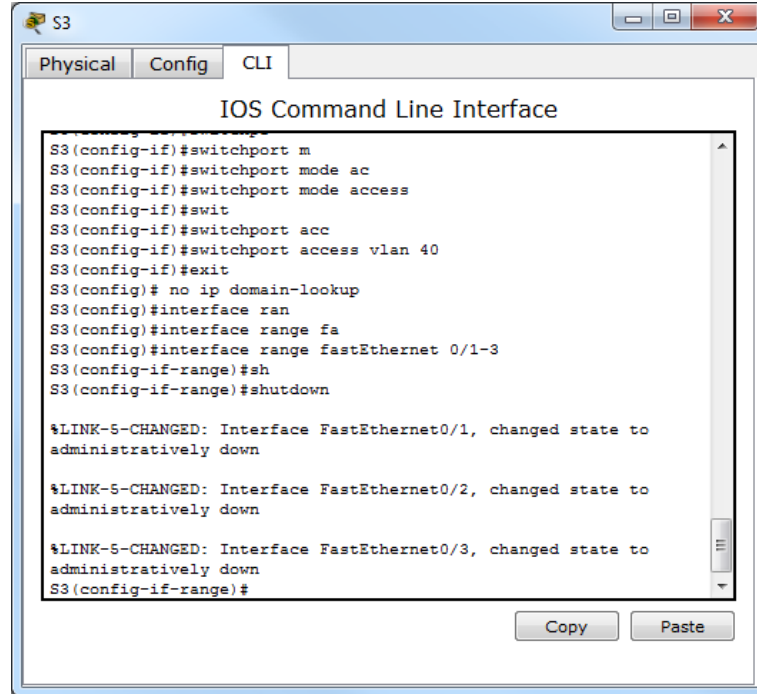


```
S1
Physical Config CLI
IOS Command Line Interface
S1(config)#interface las
S1(config)#interface ra
S1(config)#interface range fa
S1(config)#interface range fastEthernet 0/1-3
S1(config-if-range)#sh
S1(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to administratively down
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to administratively down
S1(config-if-range)#interface range fastEthernet 0/6
S1(config-if-range)#sh
S1(config-if-range)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to administratively down
S1(config-if-range)#interface range fastEthernet 0/8-24
S1(config-if-range)#sh
S1(config-if-range)#shutdown
%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
Copy Paste
```



```
S1
Physical Config CLI
IOS Command Line Interface
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
S1(config-if-range)#
Copy Paste
```

Switch (S3)



The screenshot shows the CLI window for switch S3. The 'CLI' tab is active. The terminal output displays the following commands and their results:

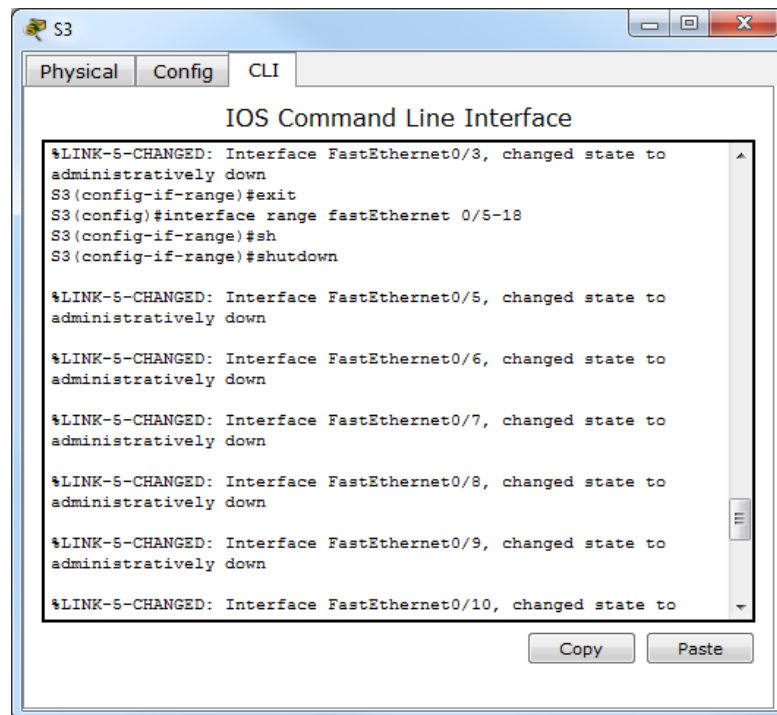
```
S3(config-if)#switchport m
S3(config-if)#switchport mode ac
S3(config-if)#switchport mode access
S3(config-if)#swit
S3(config-if)#switchport acc
S3(config-if)#switchport access vlan 40
S3(config-if)#exit
S3(config)# no ip domain-lookup
S3(config)#interface ran
S3(config)#interface range fa
S3(config)#interface range fastEthernet 0/1-3
S3(config-if-range)#sh
S3(config-if-range)#shutdown

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to
administratively down

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to
administratively down
S3(config-if-range)#
```

Buttons for 'Copy' and 'Paste' are visible at the bottom right of the terminal area.



The screenshot shows the CLI window for switch S3. The 'CLI' tab is active. The terminal output displays the following commands and their results:

```
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to
administratively down
S3(config-if-range)#exit
S3(config)#interface range fastEthernet 0/5-18
S3(config-if-range)#sh
S3(config-if-range)#shutdown

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

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

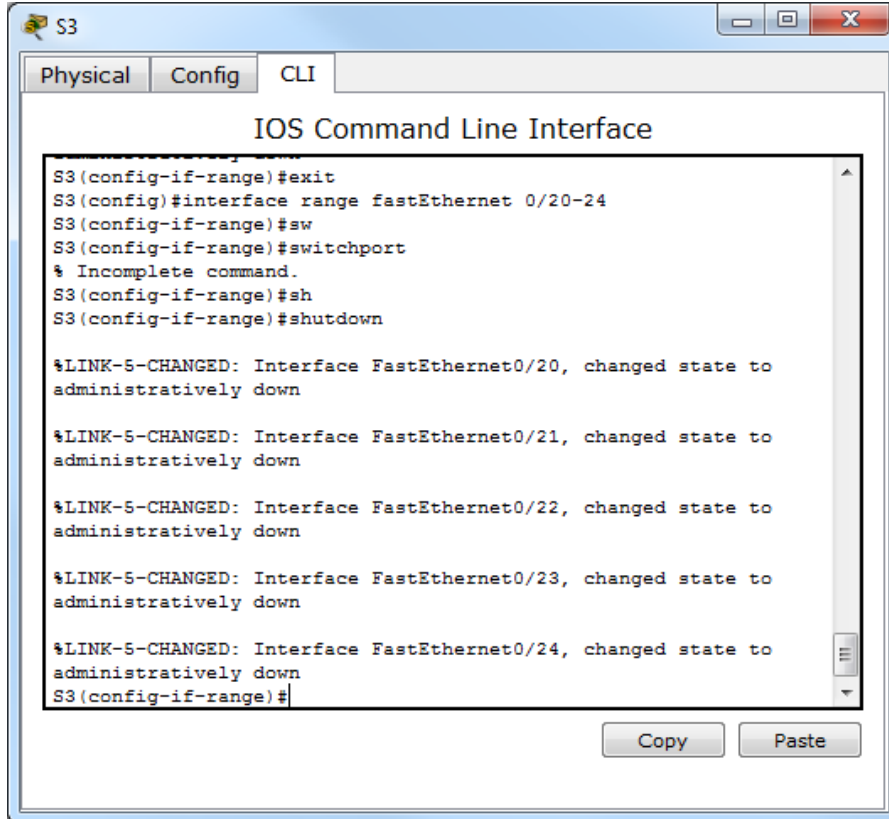
%LINK-5-CHANGED: Interface FastEthernet0/7, changed state to
administratively down

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

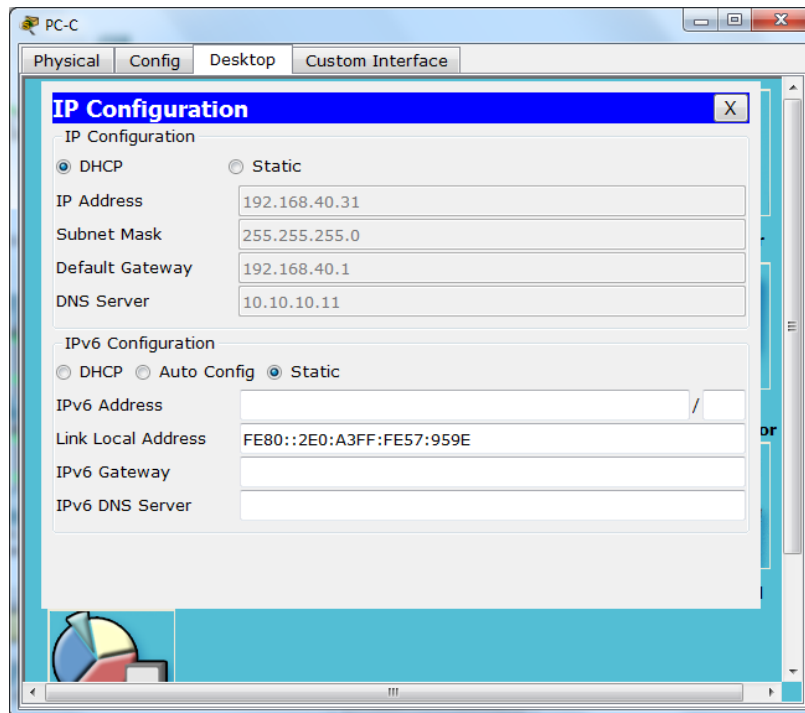
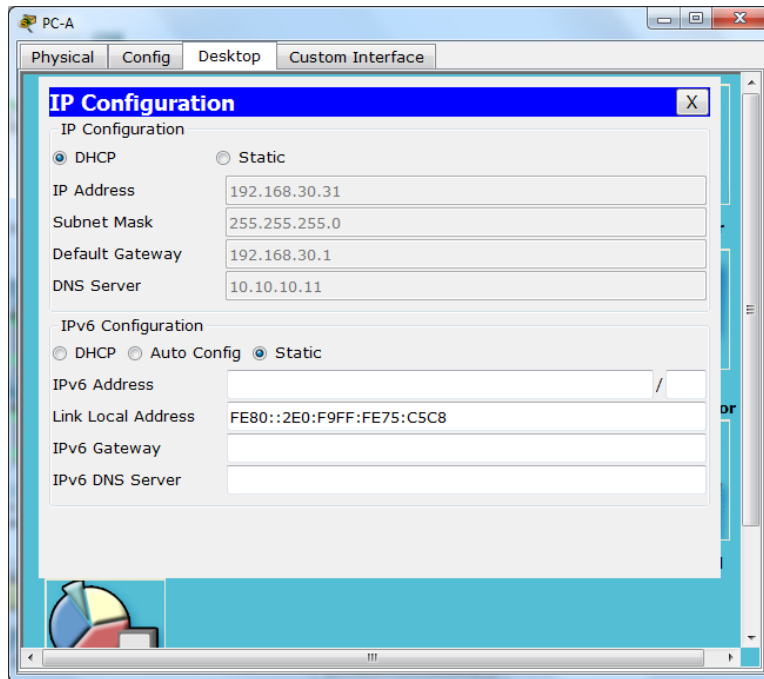
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to
administratively down

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

Buttons for 'Copy' and 'Paste' are visible at the bottom right of the terminal area.

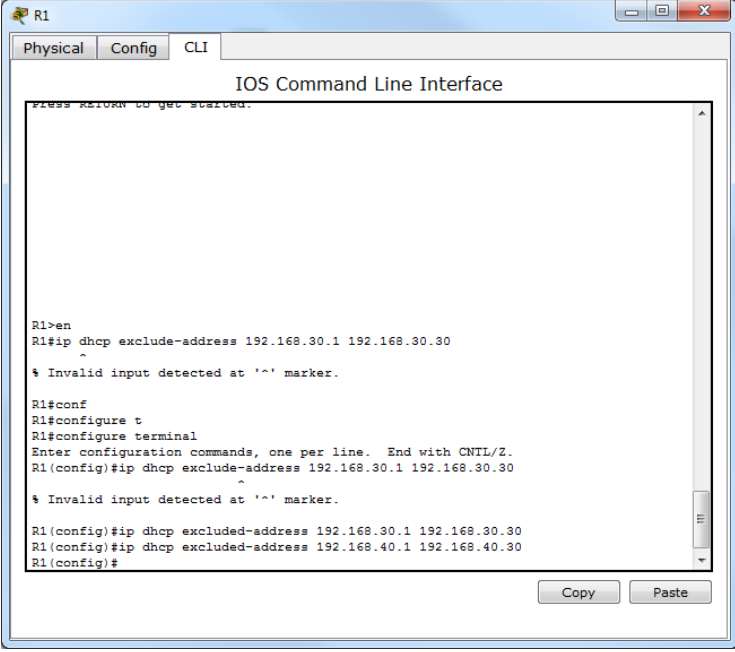


11- Implement DHCP and NAT for IPv4



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

Router (R1)



```
R1
Physical Config CLI
IOS Command Line Interface
Press RETURN to get started.

R1>en
R1#ip dhcp exclude-address 192.168.30.1 192.168.30.30
^
Invalid input detected at '^' marker.

R1#conf
R1#configure t
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp exclude-address 192.168.30.1 192.168.30.30
^
Invalid input detected at '^' marker.

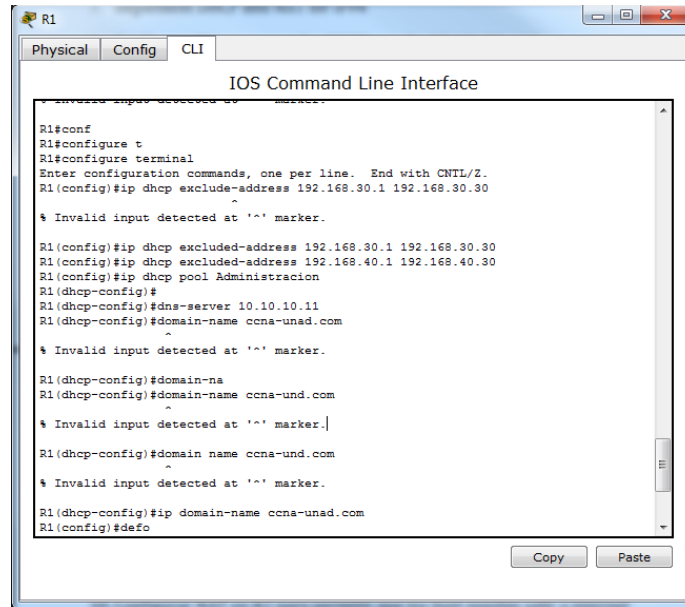
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#
```

Copy Paste

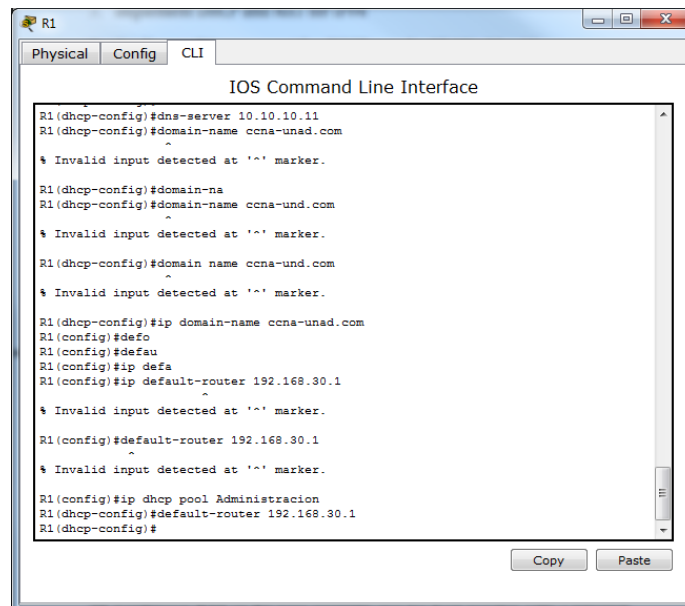
Configurar DHCP pool para VLAN 30

Name: ADMINISTRACION
DNS-Server: 10.10.10.11
Domain-Name: ccna-unad.com
Establecer default gateway.

Router (R1)



```
R1#conf
R1#configure t
R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1 (config)#ip dhcp exclude-address 192.168.30.1 192.168.30.30
% Invalid input detected at '^' marker.
R1 (config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1 (config)#ip dhcp pool Administracion
R1 (dhcp-config)#
R1 (dhcp-config)#dns-server 10.10.10.11
R1 (dhcp-config)#domain-name ccna-unad.com
% Invalid input detected at '^' marker.
R1 (dhcp-config)#domain-na
R1 (dhcp-config)#domain-name ccna-und.com
% Invalid input detected at '^' marker.|
R1 (dhcp-config)#domain name ccna-und.com
% Invalid input detected at '^' marker.
R1 (dhcp-config)#ip domain-name ccna-unad.com
R1 (config)#defo
```



```
R1 (dhcp-config)#dns-server 10.10.10.11
R1 (dhcp-config)#domain-name ccna-unad.com
% Invalid input detected at '^' marker.
R1 (dhcp-config)#domain-na
R1 (dhcp-config)#domain-name ccna-und.com
% Invalid input detected at '^' marker.
R1 (dhcp-config)#domain name ccna-und.com
% Invalid input detected at '^' marker.
R1 (dhcp-config)#ip domain-name ccna-unad.com
R1 (config)#defo
R1 (config)#defau
R1 (config)#ip defa
R1 (config)#ip default-router 192.168.30.1
% Invalid input detected at '^' marker.
R1 (config)#default-router 192.168.30.1
% Invalid input detected at '^' marker.
R1 (config)#ip dhcp pool Administracion
R1 (dhcp-config)#default-router 192.168.30.1
R1 (dhcp-config)#
```


Configurar DHCP pool para VLAN 40

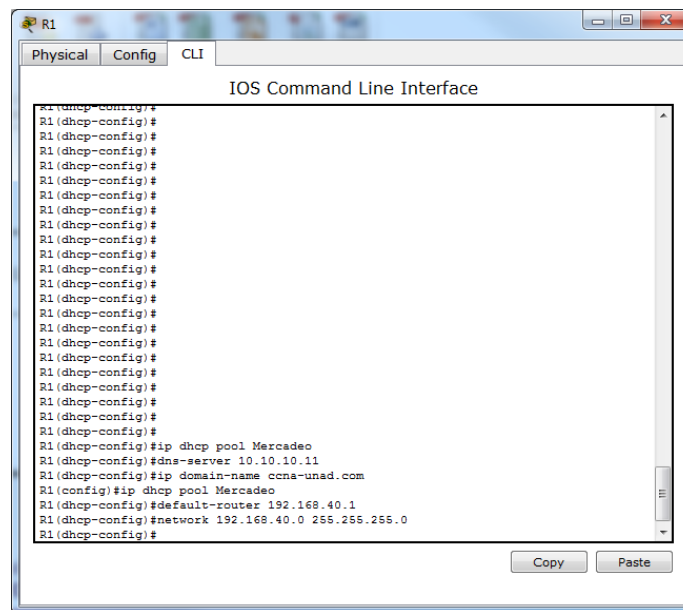
Name: MERCADEO

DNS-Server: 10.10.10.11

Domain-Name: ccna-unad.com

Establecer default gateway.

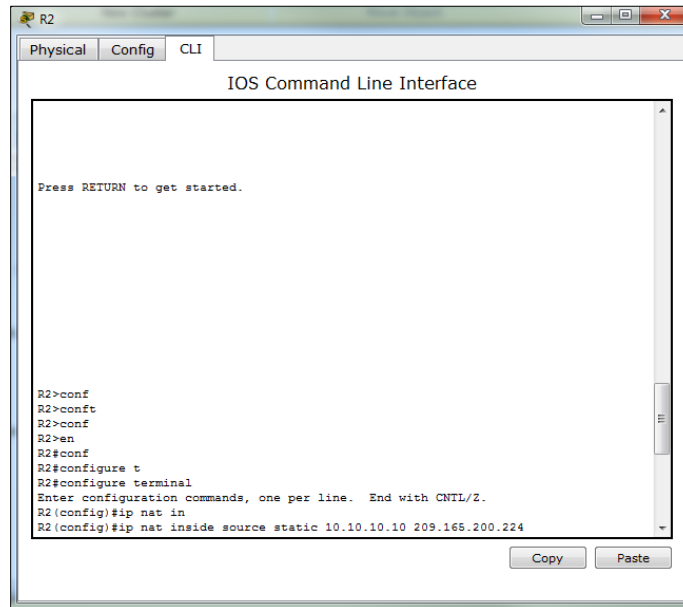
Router (R1)



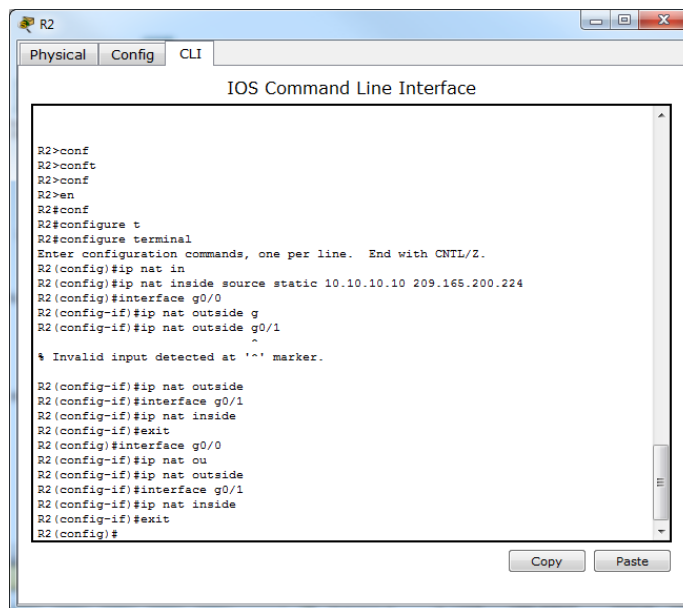
```
R1
Physical Config CLI
IOS Command Line Interface
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#
R1(dhcp-config)#ip dhcp pool Mercadeo
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#ip domain-name ccna-unad.com
R1(config)#ip dhcp pool Mercadeo
R1(dhcp-config)#default-router 192.168.40.1
R1(dhcp-config)#network 192.168.40.0 255.255.255.0
R1(dhcp-config)#
```

Copy Paste

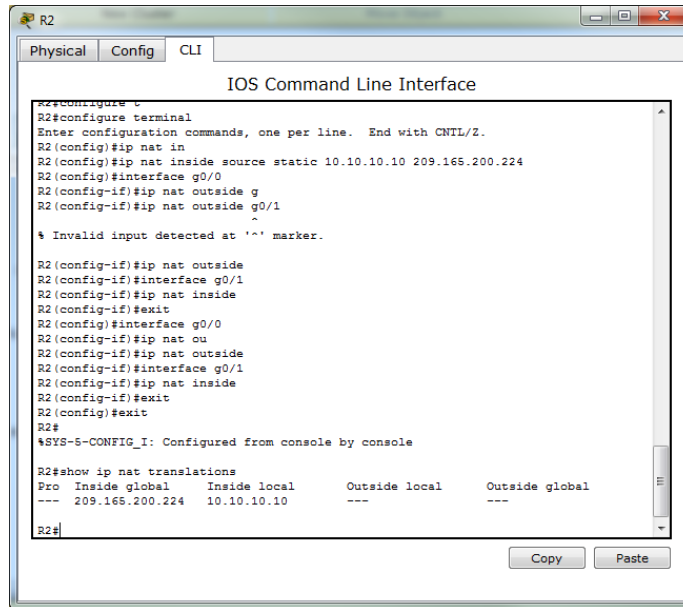
13- Configurar NAT en R2 para permitir que los host puedan salir a internet



Especificar las interfaces en (R2)



Mostrar configuración NAT en (R2)



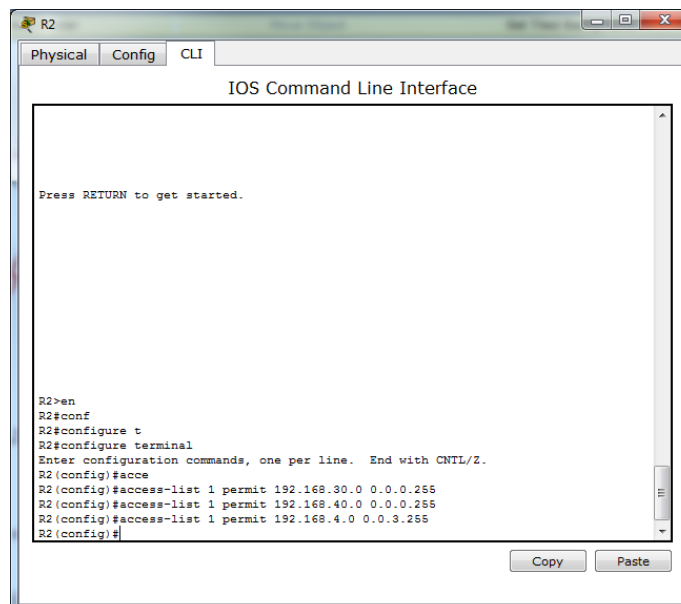
```
R2#configure t
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2 (config)#ip nat in
R2 (config)#ip nat inside source static 10.10.10.10 209.165.200.224
R2 (config)#interface g0/0
R2 (config-if)#ip nat outside g
R2 (config-if)#ip nat outside g0/1
R2 (config-if)#ip nat outside g0/1

% Invalid input detected at '^' marker.

R2 (config-if)#ip nat outside
R2 (config-if)#interface g0/1
R2 (config-if)#ip nat inside
R2 (config-if)#exit
R2 (config)#interface g0/0
R2 (config-if)#ip nat ou
R2 (config-if)#ip nat outside
R2 (config-if)#interface g0/1
R2 (config-if)#ip nat inside
R2 (config-if)#exit
R2 (config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip nat translations
Pro Inside global   Inside local       Outside local      Outside global
--- 209.165.200.224 10.10.10.10        ---               ---
R2#
```

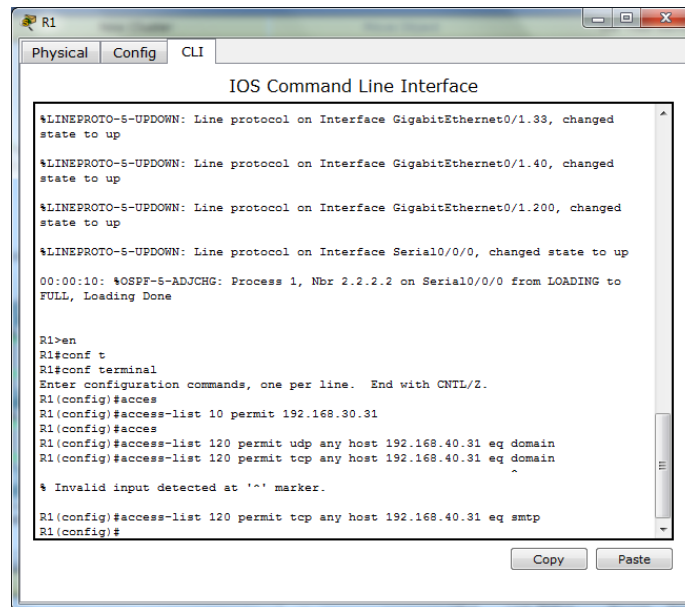
14- Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.



```
R2#en
R2#conf
R2#configure t
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2 (config)#acce
R2 (config)#access-list 1 permit 192.168.30.0 0.0.0.255
R2 (config)#access-list 1 permit 192.168.40.0 0.0.0.255
R2 (config)#access-list 1 permit 192.168.4.0 0.0.3.255
R2 (config)#
```

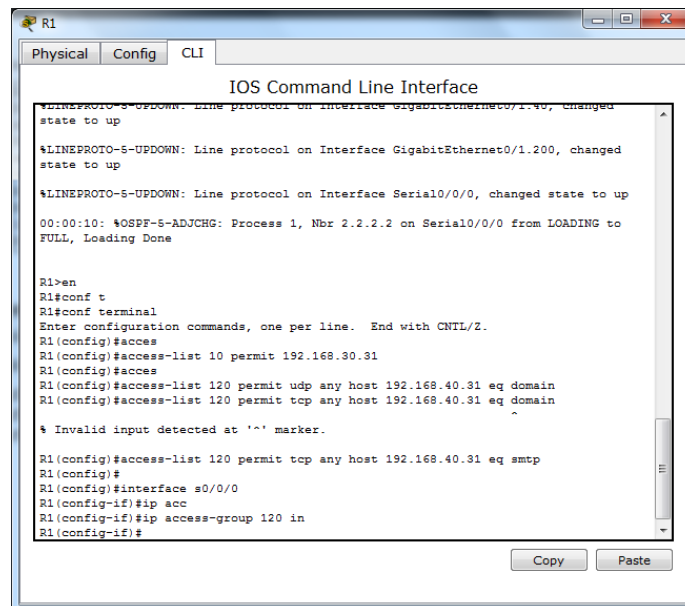
15- Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.

Router (R1)



```
R1
Physical Config CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.33, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.40, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.200, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0 from LOADING to
FULL, Loading Done

R1>en
R1#conf t
R1#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#access
R1(config)#access-list 10 permit 192.168.30.31
R1(config)#access
R1(config)#access-list 120 permit udp any host 192.168.40.31 eq domain
R1(config)#access-list 120 permit tcp any host 192.168.40.31 eq domain
^
% Invalid input detected at '^' marker.
R1(config)#access-list 120 permit tcp any host 192.168.40.31 eq smtp
R1(config)#
```

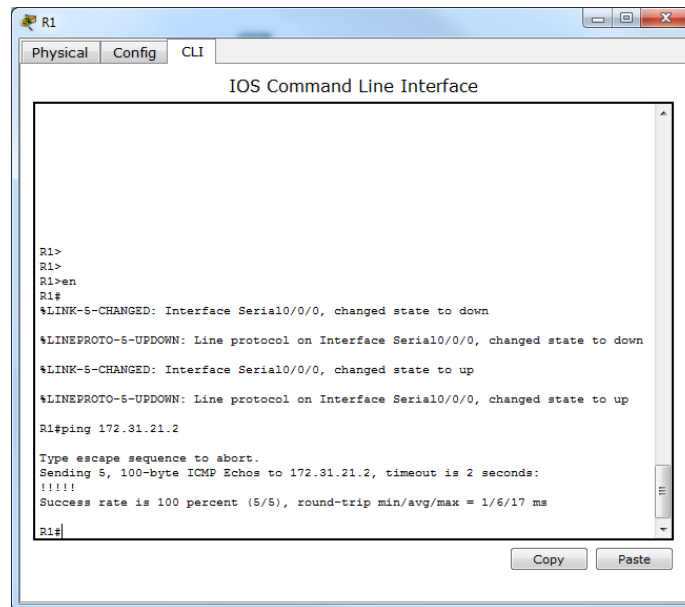


```
R1
Physical Config CLI
IOS Command Line Interface
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.40, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1.200, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
00:00:10: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Serial0/0/0 from LOADING to
FULL, Loading Done

R1>en
R1#conf t
R1#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#access
R1(config)#access-list 10 permit 192.168.30.31
R1(config)#access
R1(config)#access-list 120 permit udp any host 192.168.40.31 eq domain
R1(config)#access-list 120 permit tcp any host 192.168.40.31 eq domain
^
% Invalid input detected at '^' marker.
R1(config)#access-list 120 permit tcp any host 192.168.40.31 eq smtp
R1(config)#
R1(config)#interface s0/0/0
R1(config-if)#ip acc
R1(config-if)#ip access-group 120 in
R1(config-if)#
```

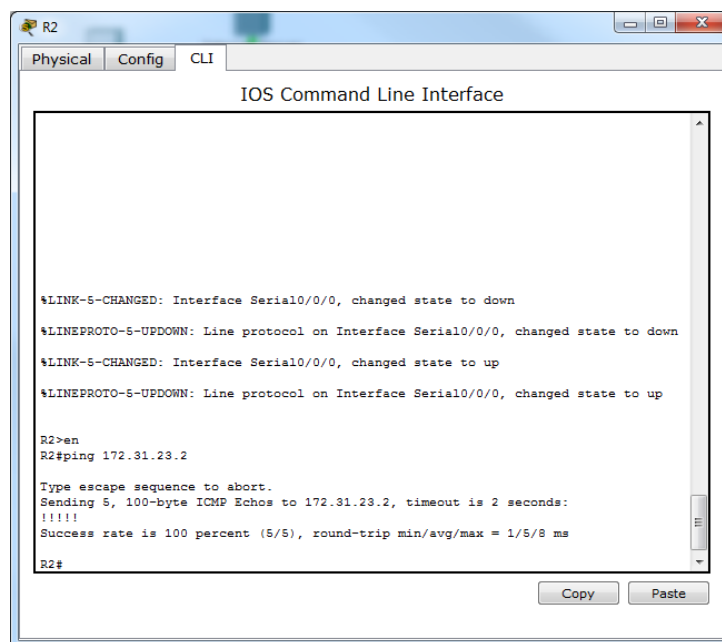
16- Verificar procesos de comunicación y re direccionamiento de tráfico en los routers mediante el uso

Ping y Traceroute. R-1 a R2



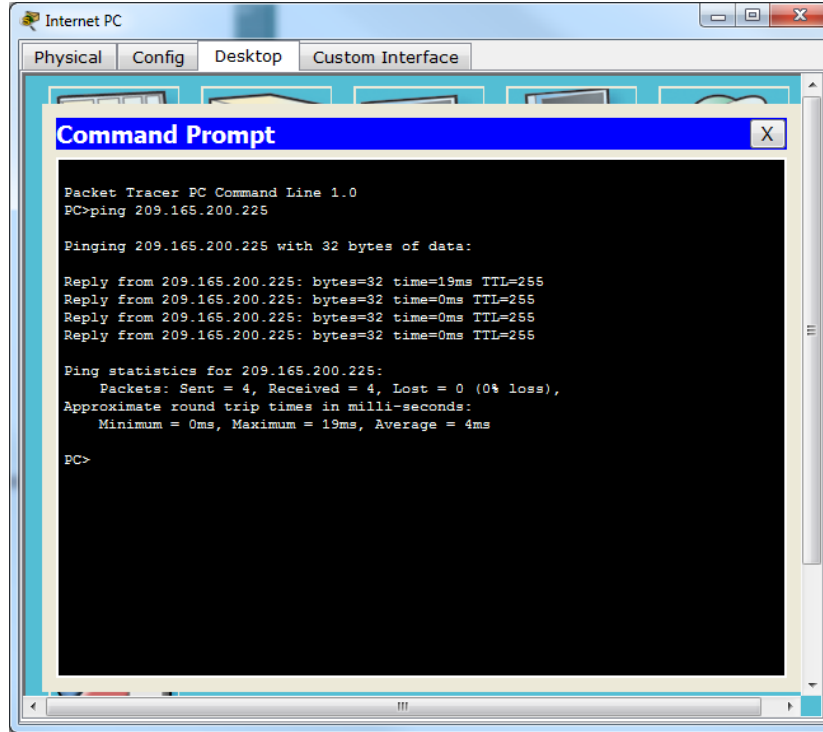
```
R1
R1>
R1>
R1>en
R1#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to down
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R1#ping 172.31.21.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.21.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/17 ms
R1#
```

Ping y Traceroute R-2 a R-3



```
R2
R2>en
R2#ping 172.31.23.2
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.31.23.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/8 ms
R2#
```

From Internet-PC to Default Gateway



The screenshot shows a Packet Tracer PC Command Prompt window titled "Internet PC". The window has tabs for "Physical", "Config", "Desktop", and "Custom Interface". The "Desktop" tab is active, and a "Command Prompt" window is open. The command prompt displays the following text:

```
Packet Tracer PC Command Line 1.0
PC>ping 209.165.200.225

Pinging 209.165.200.225 with 32 bytes of data:

Reply from 209.165.200.225: bytes=32 time=19ms TTL=255
Reply from 209.165.200.225: bytes=32 time=0ms TTL=255
Reply from 209.165.200.225: bytes=32 time=0ms TTL=255
Reply from 209.165.200.225: bytes=32 time=0ms TTL=255

Ping statistics for 209.165.200.225:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 19ms, Average = 4ms

PC>
```

Conclusiones

Comprendí como usar Packet Tracer, cuáles son sus funciones como herramienta de redes.

En este curso tuve la oportunidad trabajar diferentes ejemplos para poner en práctica nuestros conocimientos como configurar los switch, router, los pc Vlan. Donde se queda reflejado en el escenario propuesto en la prueba de habilidad.

Aprendí analizar un modelo con especificaciones únicas en redes para un resultado que un cliente posible en el futuro como ingeniero de Sistemas desee.

Bibliografía

CISCO. (2014). Introducción a redes conmutadas. Principios de Enrutamiento y Conmutación.

Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module1/index.html#1.0.1.1>

CISCO. (2014). Configuración y conceptos básicos de Switching. Principios de Enrutamiento y Conmutación. Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module2/index.html#2.0.1.1>

CISCO. (2014). Conceptos de Routing. Principios de Enrutamiento y Conmutación. Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module4/index.html#4.0.1.1>

CISCO. (2014). Enrutamiento entre VLANs. Principios de Enrutamiento y Conmutación. Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module5/index.html#5.0.1.1>

CISCO. (2014). Enrutamiento Estático. Principios de Enrutamiento y Conmutación. Recuperado de: <https://static-course-assets.s3.amazonaws.com/RSE50ES/module6/index.html#6.0.1.1>