



DIPLOMADO DE PROFUNDIZACION CISCO (DISEÑO E IMPLEMENTACION DE  
SOLUCIONES INTEGRALES LAN / WAN)

PRUEBAS DE HABILIDADES PRACTICAS CCNA

Presentado por:

Alexander Quintero Diez

Código.: 79390844

PROGRAMA

INGENIERIA DE SISTEMAS

UNIVERSIDAD NACIONAL ABIERTA Y A DISTANCIA UNAD

Escuela de Ciencias Básicas, Tecnología e Ingeniería

Julio de 2018



*A toda mi familia y en especial a mi esposa, por apoyarme e incentivar me para convertirme en profesional estudiando ingeniería de sistemas.*



## AGRADECIMIENTO

A todo el personal de la universidad, que me brindaron su apoyo y colaboración directa e indirectamente durante todo el transcurso del programa de ingeniería de sistemas, con sus orientaciones, capacitaciones, prácticas y demás actividades realizadas.






## RESUMEN

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 configuración de redes Cisco. En la configuración de switches y routers, empleando configuraciones de topologías más utilizadas.

Palabras Claves: Cisco, Switches, Routers, Topología, Redes, Configuración

### **Abstract**

Identify the degree of development of skills and abilities that were acquired throughout the course and through which the levels of comprehension and solution of problems related to various aspects of configuration of Cisco networks will be tested. In the configuration of switches and routers, using most used topology configurations.





## TABLA DE CONTENIDO


INTRODUCCION .....	6
Planteamiento del problema .....	7
1.- Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario .....	8
2.- Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:.....	19
3.- Configurar VLANs, Puertos troncales, puertos de acceso, encapsulamiento, Inter-VLAN Routing y Seguridad en los Switches acorde a la topología de red establecida. ....	26
4.- En el Switch 3 deshabilitar DNS lookup .....	33
5.- Asignar direcciones IP a los Switches acorde a los lineamientos. ....	34
6.- Desactivar todas las interfaces que no sean utilizadas en el esquema de red. ....	35
7.- Implementar DHCP y NAT para IPv4.....	36
8.- Configurar R1 como servidor DHCP para las VLANs 30 y 40. ....	38
9.- Reservar las primeras 30 direcciones IP de las VLAN 30 y 40 para configuraciones estáticas. ....	41
10.- Configurar NAT en R2 para permitir que los host puedan salir a internet.....	42
11.- Configurar al menos dos listas de acceso de tipo estándar a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2. ....	43
12.- Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.....	45
13.- Verificar procesos de comunicación y Re direccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute. ....	46
CONCLUSIONES .....	49
REFERENCIAS BIBLIOGRAFICAS .....	50



## INTRODUCCION

Con la presente actividad consolidamos los conocimientos aprendidos en la configuración de VLANs, OSPFv2, DHCPv4 y ACL en switches y routers, diseñar e implementar NAT dinámicas y estáticas, listas de acceso bajo los protocolos IPv4.

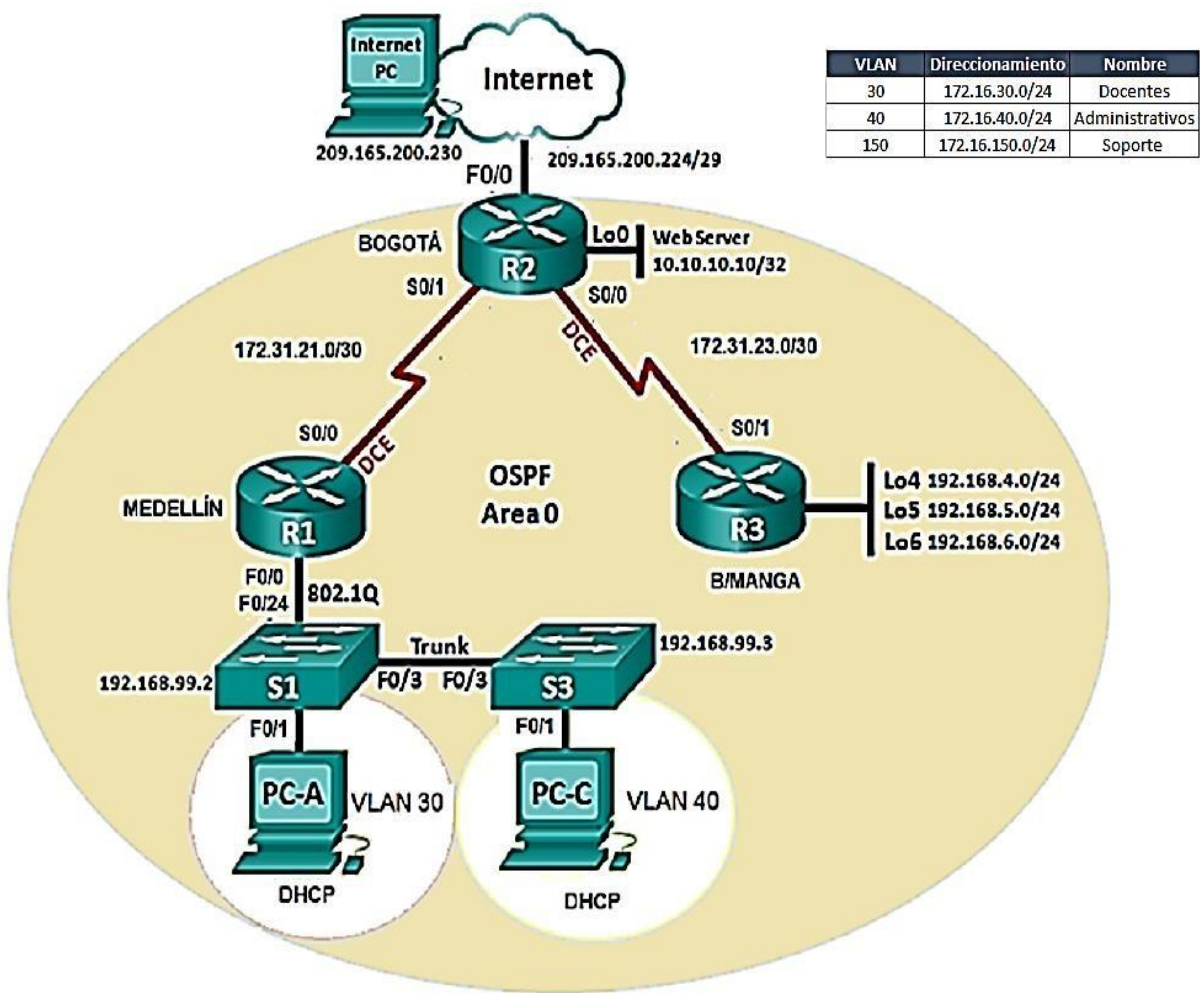
Realizamos ejercicios de configuración de redes utilizando distintas topologías con la herramienta Packet Tracer.



## Planteamiento del problema

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

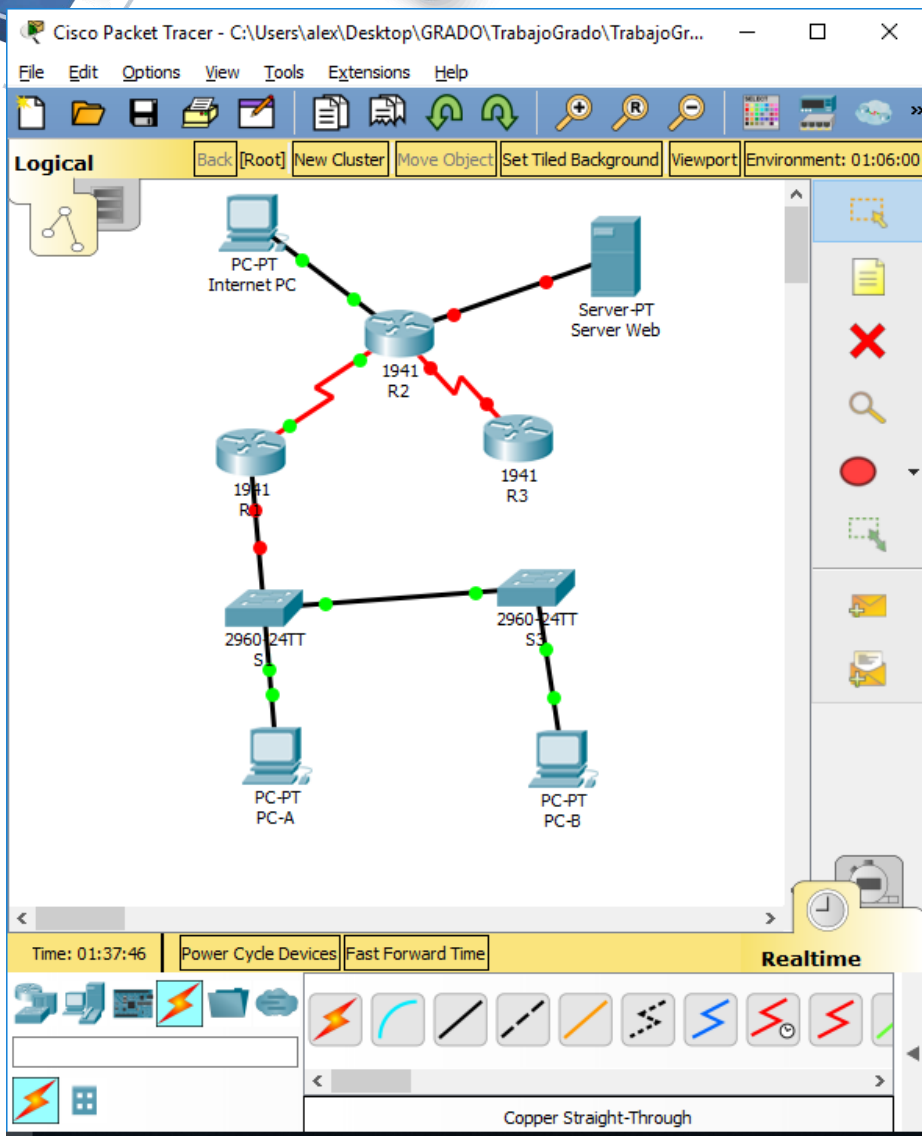


**1.- Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario**

**CONFIGURACION TOPOLOGIA SOLICITADA**

Dispositivo	Interface	Red	Rangos
Router 1	S0/0/0 dce	172.31.21.1/30	172.31.21.0/30
	G0/0	192.168.99.1/24	192.168.99.0/24
Router 2	S0/0/0	172.31.23.1/30	172.31.23.0/30
	S0/0/1	172.31.21.2.30	172.31.21.0/30
	G0/0	209.165.200.224/29	209.165.200.248/29
	G0/1	10.10.10.11./29	10.10.10.10/29
Router 3	S0/0/1	172.31.23.2/30	172.31.23.0/30
	Lo4	192.168.4.0/24	
	Lo5	192.168.5.0/24	
	Lo6	192.168.6.0/24	
Switche 1	Vlan	192.168.99.2/24	
Switche 2	Vlan	192.168.99.3/24	
Vlan	Vlan 30	192.168.30.0/24	
Vlan	Vlan 40	192.168.40.0/24	
Vlan	Vlan 150	192.168.150.0/24	
Server	G0/0	209.165.200.230/24	
PC-A	FA0/6	192.168.30.31/24	192.168.30.0
PC-B	FA0/18	192.168.40.54/24	192.168.40.0
Pc Internet	FA0/1	209.165.200.230/29	209.165.200.225

# TOPOLOGIA



Se borran las configuraciones de routers y se reinician

```
IOS Command Line Interface
System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2010 by Cisco Systems, Inc.
Total memory size = 512 MB - On-board = 512 MB, DIMM0 = 0 MB
CISCO1941/RS platform with 524288 Kbytes of main memory
Main memory is configured to 64/-1(On-board/DIMM0) bit mode with
ECC disabled

Readonly ROMMON initialized

program load complete, entry point: 0x80803000, size: 0x1b340
program load complete, entry point: 0x80803000, size: 0x1b340

IOS Image Load Test

Digitally Signed Release Software
program load complete, entry point: 0x81000000, size: 0x2bb1c58
Self decompressing the image :
#####
##### [OK]
Smart Init is enabled
smart init is sizing iomem
      TYPE      MEMORY_REQ      Onboard devices &
HWIC Slot 0    0x00200000
buffer pools  0x01E8F000

Ctrl+F6 to exit CLI focus
```

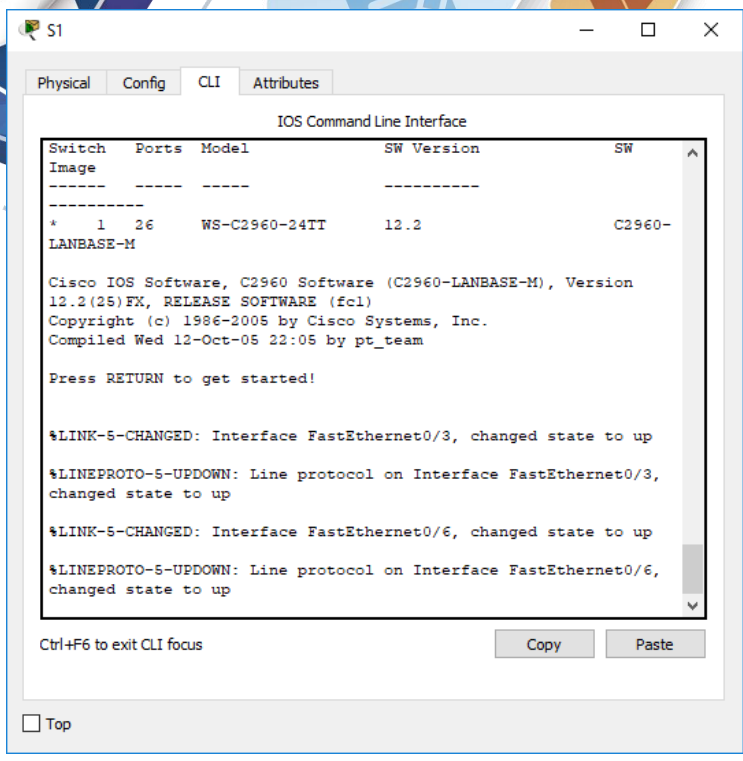
Borrar la configuración de los switches y las bases de datos de la vlan

```
IOS Command Line Interface
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6,
changed state to up

Switch#enable
Switch#erase start
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Switch#erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Switch#delete vlan.dat
Delete filename [vlan.dat]?
Delete flash:/vlan.dat? [confirm]
%Error deleting flash:/vlan.dat (No such file or directory)

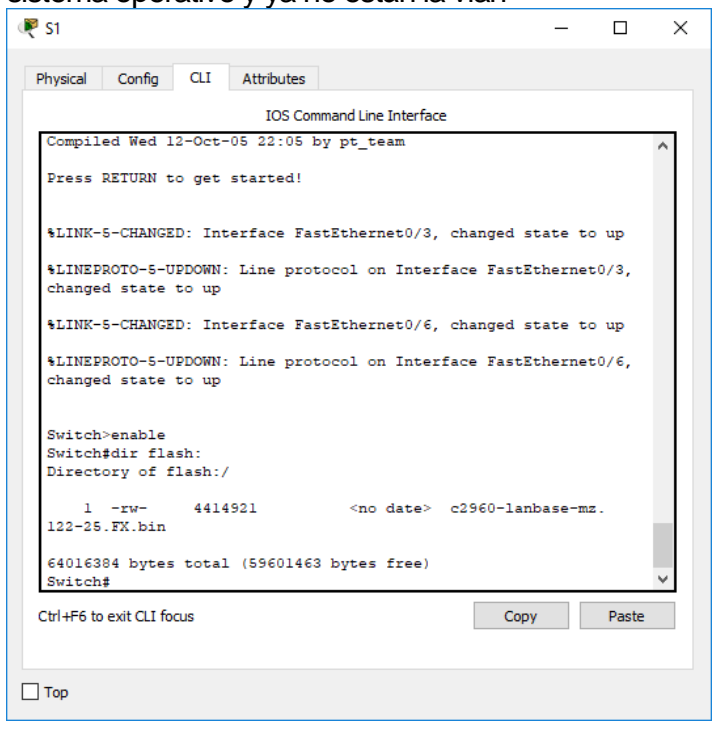
Switch#

Ctrl+F6 to exit CLI focus
```

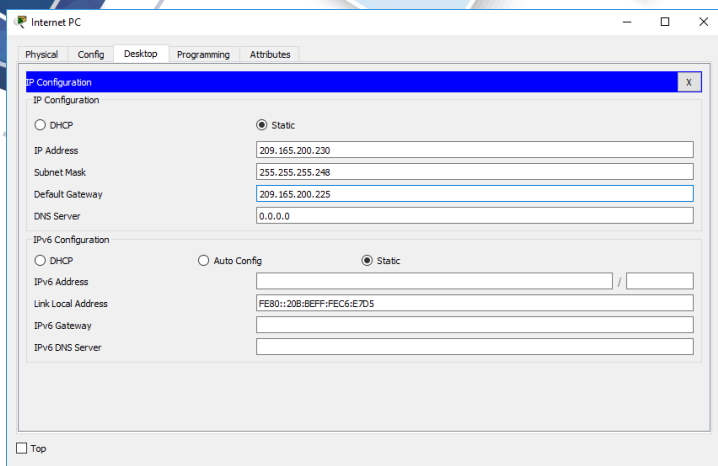


Se inicia el switch

Se verifica que las bases de datos no se encuentran en el flash, solo se encuentra el sistema operativo y ya no están la vlan

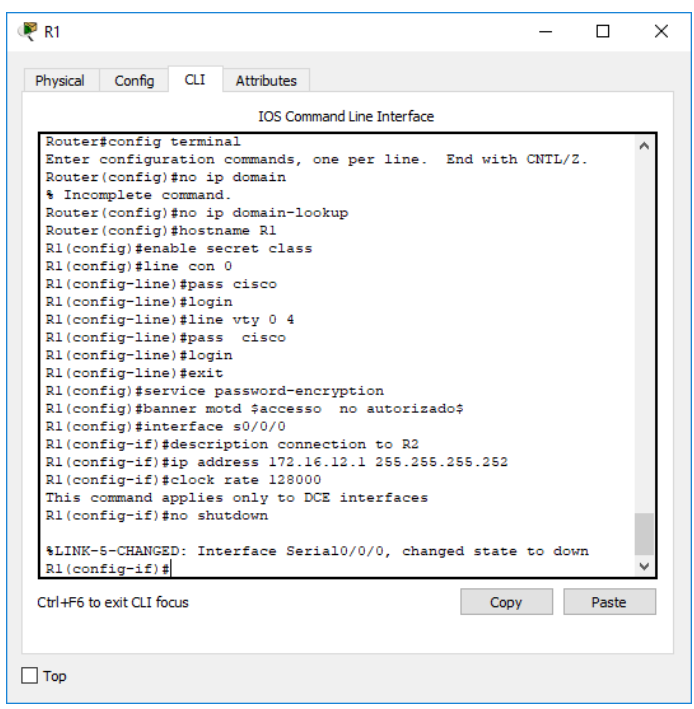


## Se configura la PC de Internet

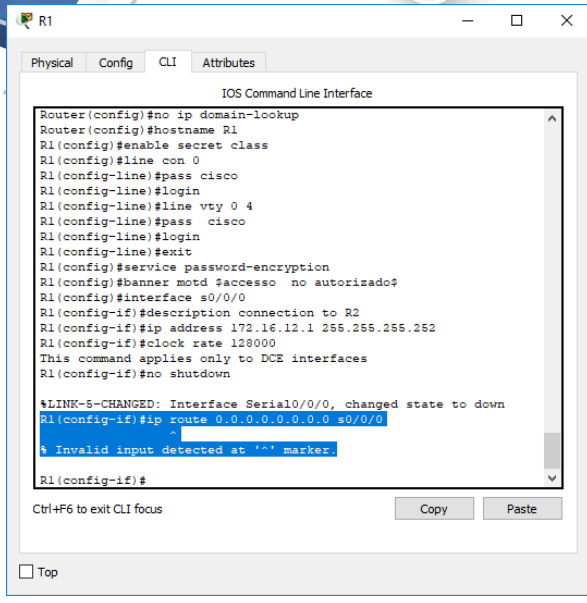


## Se configura el router 1

Desactivar lookup DNS y configuración del router con su dirección IP, password y su interfaz serial

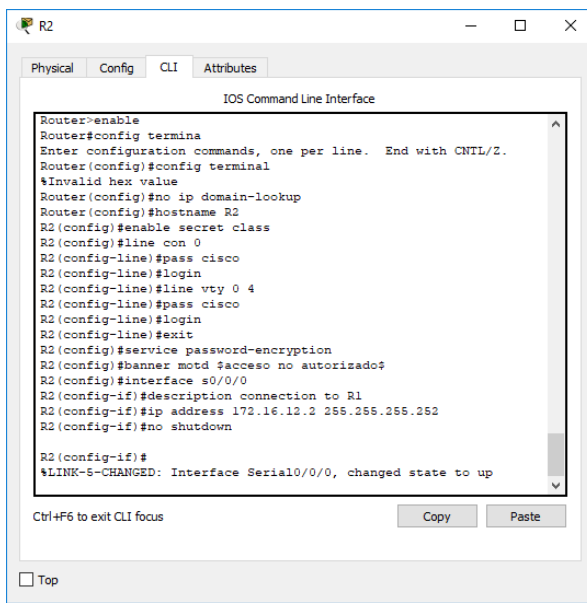


### Packer trace no soporte la configuración se salida de una ruta por defecto



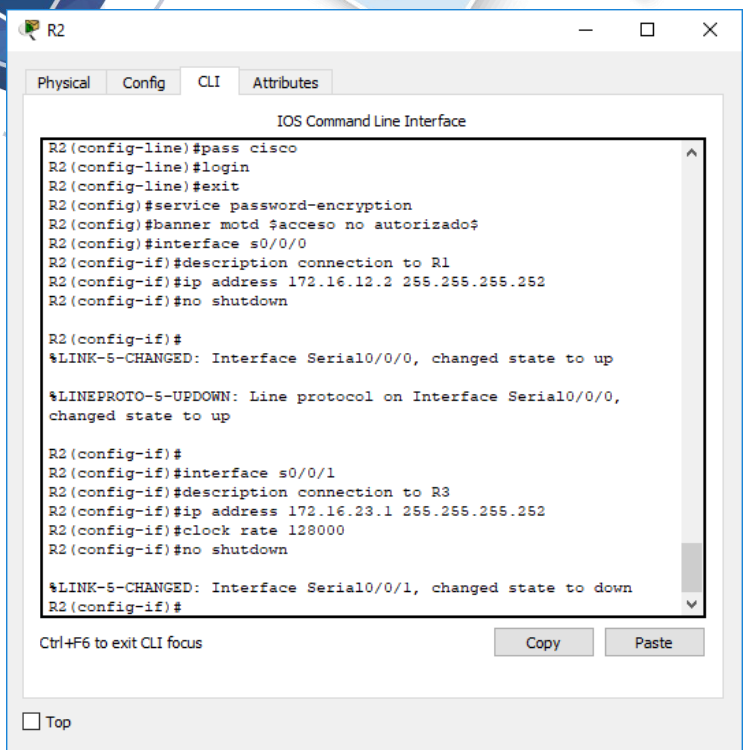
```
Router(config)#no ip domain-lookup
Router(config)#hostname R1
R1(config)#enable secret class
R1(config)#line con 0
R1(config-line)#pass cisco
R1(config-line)#login
R1(config-line)#line vty 0 4
R1(config-line)#pass cisco
R1(config-line)#login
R1(config-line)#exit
R1(config)#service password-encryption
R1(config)#banner motd $accesso no autorizado$
R1(config)#interface s0/0/0
R1(config-if)#description connection to R2
R1(config-if)#ip address 172.16.12.1 255.255.255.252
R1(config-if)#clock rate 128000
This command applies only to DCE interfaces
R1(config-if)#no shutdown
R1(config-if)#ip route 0.0.0.0.0.0.0.0 s0/0/0
% Invalid input detected at '^' marker.
R1(config-if)#
```

Configuración del route 2, configuración de password, nombre del router R2, activacion interfaz serial 0/0/0



```
Router>enable
Router(config)#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#config terminal
%Invalid hex value
Router(config)#no ip domain-lookup
Router(config)#hostname R2
R2(config)#enable secret class
R2(config)#line con 0
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#line vty 0 4
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#service password-encryption
R2(config)#banner motd $accesso no autorizado$
R2(config)#interface s0/0/0
R2(config-if)#description connection to R1
R2(config-if)#ip address 172.16.12.2 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
```

## Activación puerto serial 1



```
R2
Physical Config CLI Attributes
IOS Command Line Interface
R2(config-line)#pass cisco
R2(config-line)#login
R2(config-line)#exit
R2(config)#service password-encryption
R2(config)#banner motd $acceso no autorizado$
R2(config)#interface s0/0/0
R2(config-if)#description connection to R1
R2(config-if)#ip address 172.16.12.2 255.255.255.252
R2(config-if)#no shutdown

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

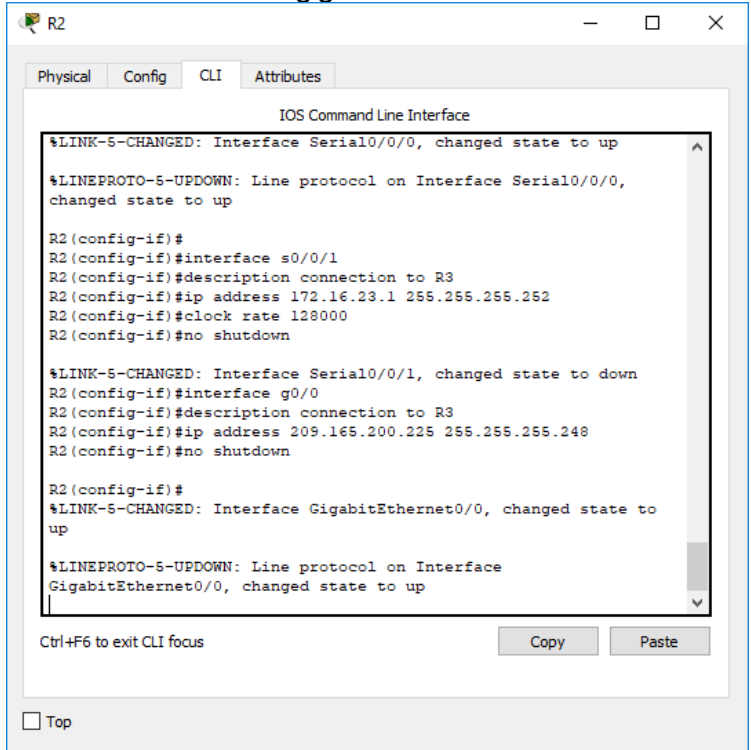
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up

R2(config-if)#
R2(config-if)#interface s0/0/1
R2(config-if)#description connection to R3
R2(config-if)#ip address 172.16.23.1 255.255.255.252
R2(config-if)#clock rate 128000
R2(config-if)#no shutdown

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

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

## Activación del interfaz gigabit



```
R2
Physical Config CLI Attributes
IOS Command Line Interface

%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

R2(config-if)#
R2(config-if)#interface s0/0/1
R2(config-if)#description connection to R3
R2(config-if)#ip address 172.16.23.1 255.255.255.252
R2(config-if)#clock rate 128000
R2(config-if)#no shutdown

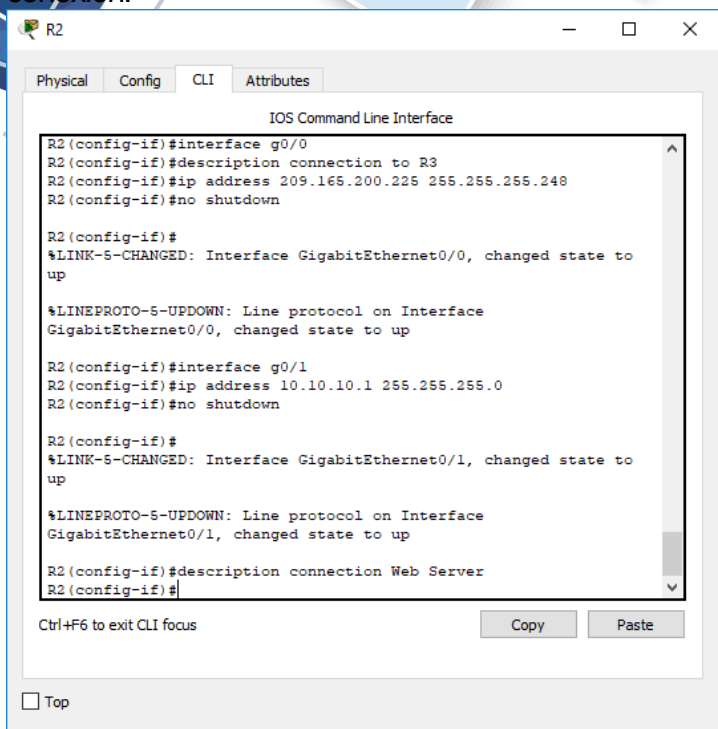
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#interface g0/0
R2(config-if)#description connection to R3
R2(config-if)#ip address 209.165.200.225 255.255.255.248
R2(config-if)#no shutdown

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

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

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

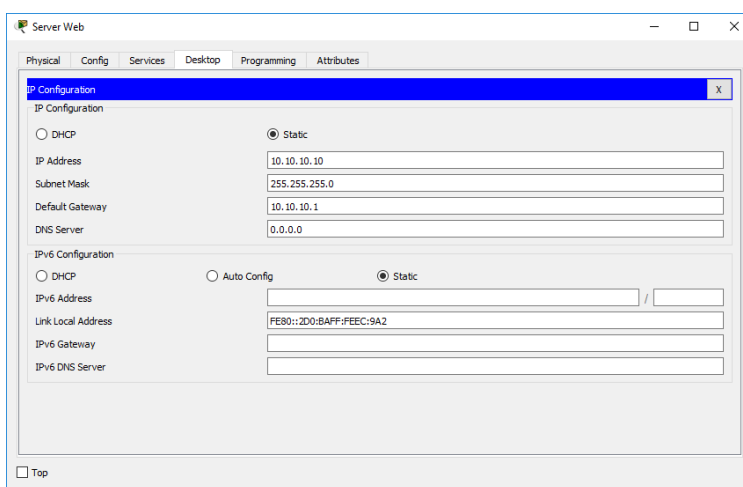
Se configura del servidor WEB en vez de "Lo" ya que packer tracer no soporta este tipo de conexión.



The screenshot shows the R2 CLI configuration window with the following text:

```
R2  
Physical Config CLI Attributes  
IOS Command Line Interface  
R2(config-if)#interface g0/0  
R2(config-if)#description connection to R3  
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 GigabitEthernet0/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up  
  
R2(config-if)#interface g0/1  
R2(config-if)#ip address 10.10.10.1 255.255.255.0  
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)#description connection Web Server  
R2(config-if)#  
  
Ctrl+F6 to exit CLI focus  
Copy Paste  
Top
```

En el servidor



The screenshot shows the Server Web IP Configuration window with the following settings:

IP Configuration	
IP Configuration	
<input type="radio"/> DHCP <input checked="" type="radio"/> 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	
<input type="radio"/> DHCP <input type="radio"/> Auto Config <input checked="" type="radio"/> Static	
IPv6 Address	
Link Local Address	FE80::200:BAFF:FEEC:9A2
IPv6 Gateway	
IPv6 DNS Server	

## Configuración del router 3, con las mismas configuraciones de los router anteriores

```
Router>enable
Router#config 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)#pass cisco
R3(config-line)#login
R3(config-line)#line vty 0 4
R3(config-line)#pass cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#service password-encryption
^
% Invalid input detected at '^' marker.

R3(config)#service password-encryption
R3(config)#banner motd $acceso no autorizado$
R3(config)#
```

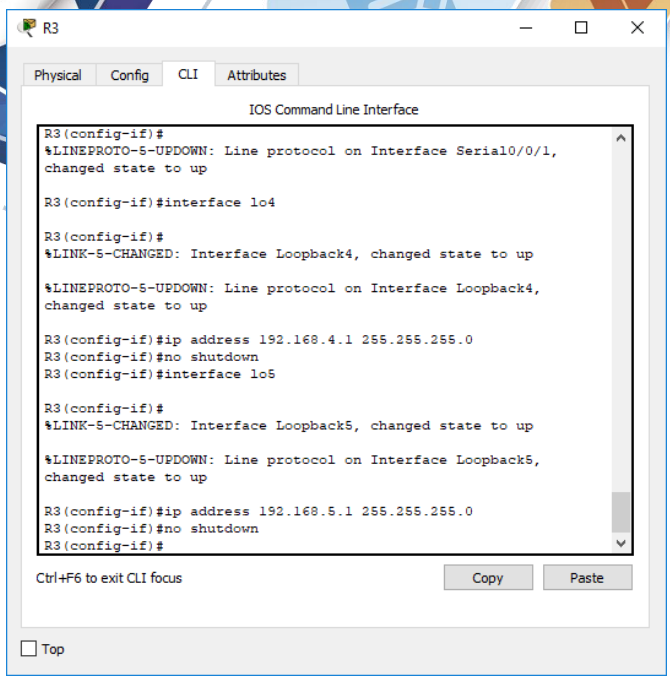
## Configuración de las lookbackp

```
R3(config)#line con 0
R3(config-line)#pass cisco
R3(config-line)#login
R3(config-line)#line vty 0 4
R3(config-line)#pass cisco
R3(config-line)#login
R3(config-line)#exit
R3(config)#service password-encryption
^
% Invalid input detected at '^' marker.

R3(config)#service password-encryption
R3(config)#banner motd $acceso no autorizado$
R3(config)#interface s0/0/1
R3(config-if)#description connection to R2
R3(config-if)#ip address 172.16.23.2 255.255.255.252
R3(config-if)#no shutdown

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

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

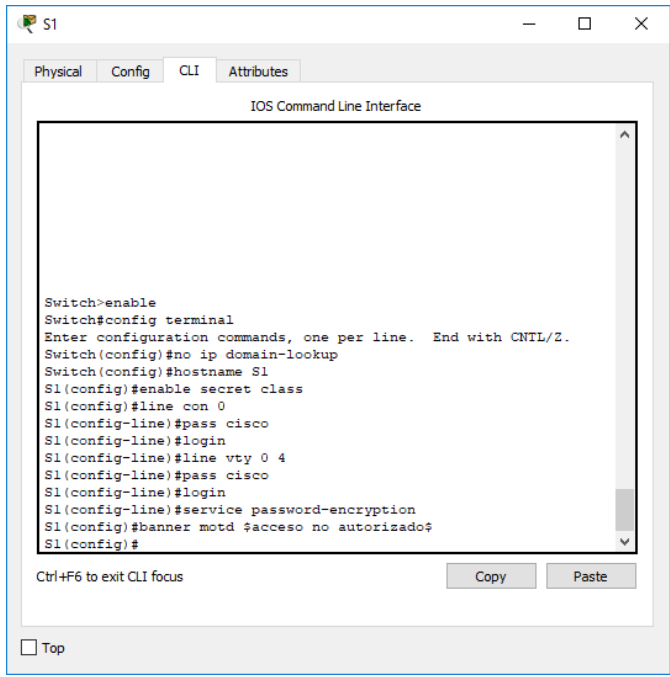


The screenshot shows a terminal window titled 'R3' with tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the configuration of three interfaces: Serial0/0/1, Loopback4, and Loopback5. Each interface is configured with an IP address, 'no shutdown', and 'no ip domain-lookup'. The terminal text is as follows:

```
R3(config-if)#  
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,  
changed state to up  
  
R3(config-if)#interface lo4  
  
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 address 192.168.4.1 255.255.255.0  
R3(config-if)#no shutdown  
R3(config-if)#interface 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 address 192.168.5.1 255.255.255.0  
R3(config-if)#no shutdown  
R3(config-if)#  
R3(config-if)#
```

At the bottom of the terminal window, there is a 'Ctrl+F6 to exit CLI focus' message and 'Copy' and 'Paste' buttons. A 'Top' button is also visible at the bottom left of the window.

### Configuración del switch 1



The screenshot shows a terminal window titled 'S1' with tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the configuration of a switch, including enabling the terminal, setting the hostname to S1, and configuring console and vty lines with passwords and login restrictions. The terminal text is as follows:

```
Switch>enable  
Switch#config terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)#no ip domain-lookup  
Switch(config)#hostname S1  
S1(config)#enable secret class  
S1(config)#line con 0  
S1(config-line)#pass cisco  
S1(config-line)#login  
S1(config-line)#line vty 0 4  
S1(config-line)#pass cisco  
S1(config-line)#login  
S1(config-line)#service password-encryption  
S1(config)#banner motd $acceso no autorizado$  
S1(config)#
```

At the bottom of the terminal window, there is a 'Ctrl+F6 to exit CLI focus' message and 'Copy' and 'Paste' buttons. A 'Top' button is also visible at the bottom left of the window.

### Configuración switch 3

```
S3
Physical Config CLI Attributes
IOS Command Line Interface

% Invalid input detected at '^' marker.
S3(config)#pass cisco
% Invalid input detected at '^' marker.
S3(config)#login line vty 0 4
% Invalid input detected at '^' marker.
S3(config)#pass cisco
% Invalid input detected at '^' marker.
S3(config)#line con 0
S3(config-line)#pass cisco
S3(config-line)#login
S3(config-line)#line vty 0 4
S3(config-line)#pass cisco
S3(config-line)#login
S3(config-line)#exit
S3(config)#service password-encryption
S3(config)#banner motd %acceso no autorizado%
S3(config)#
```

Ctrl+F6 to exit CLI focus      Copy      Paste

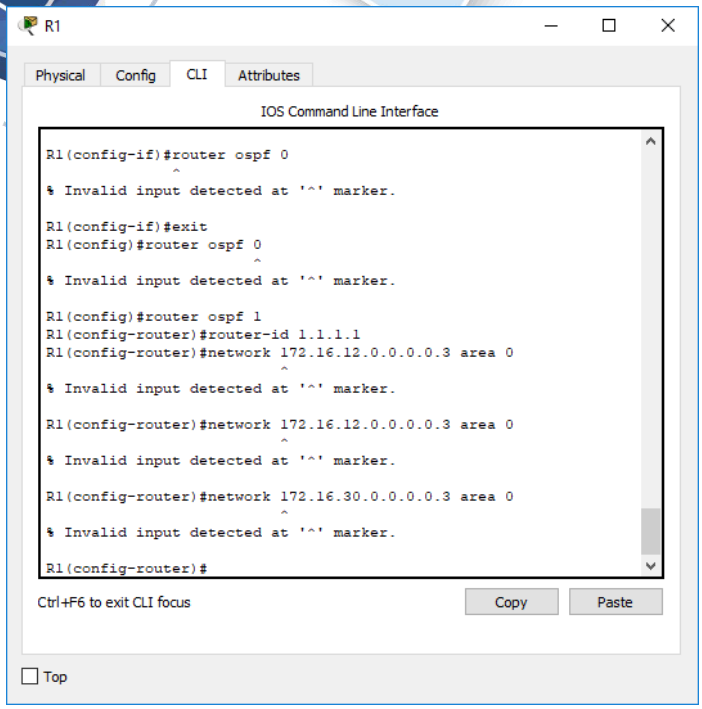
Top

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

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

OSPFv2 área 0

## Packet Tracer no soporta los comandos

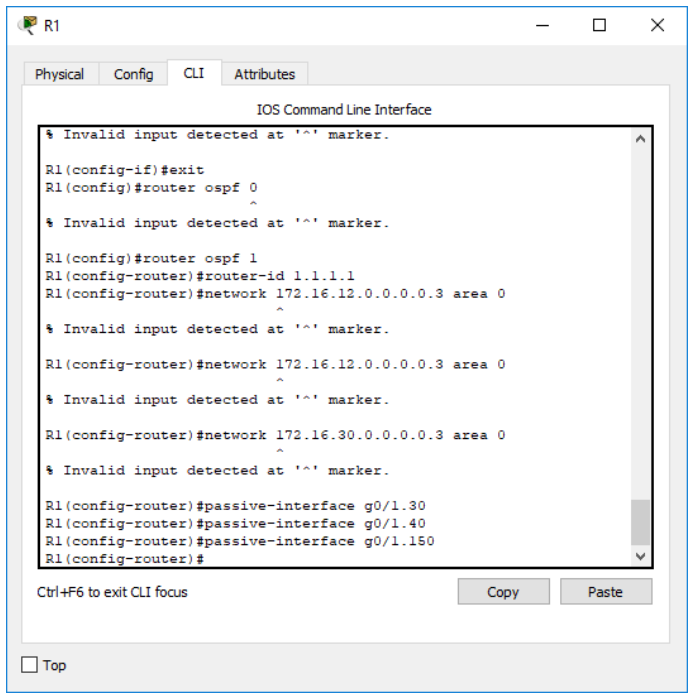


The screenshot shows the CLI window for router R1. The user has entered several commands, but several have failed due to invalid input markers. The successful commands are:

```
R1(config-if)#router ospf 0
R1(config-if)#exit
R1(config)#router ospf 0
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 172.16.12.0.0.0.0.3 area 0
R1(config-router)#network 172.16.12.0.0.0.0.3 area 0
R1(config-router)#network 172.16.30.0.0.0.0.3 area 0
R1(config-router)#
```

The failed commands are marked with '^' and the error message: '% Invalid input detected at '^' marker.' The window also shows 'Ctrl+F6 to exit CLI focus', 'Copy', and 'Paste' buttons.

## Establecer las interfaces como pasivas



The screenshot shows the CLI window for router R1. The user has entered several commands, and the last three have been successful in configuring passive interfaces. The successful commands are:

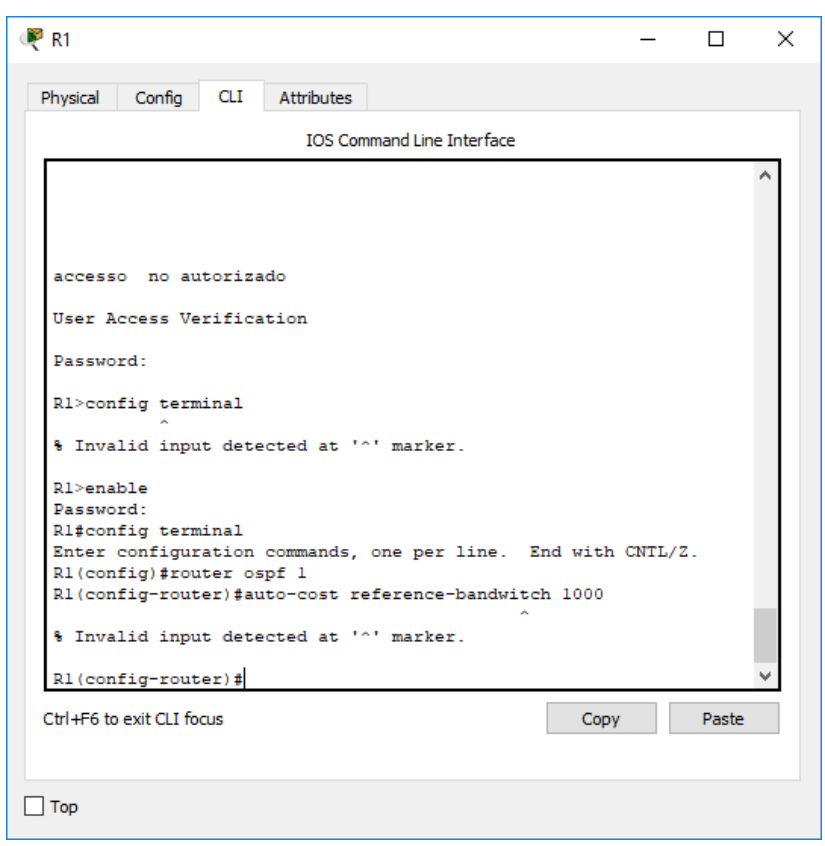
```
R1(config-router)#passive-interface g0/1.30
R1(config-router)#passive-interface g0/1.40
R1(config-router)#passive-interface g0/1.150
R1(config-router)#
```

The window also shows 'Ctrl+F6 to exit CLI focus', 'Copy', and 'Paste' buttons.

### Verificar información de OSPF

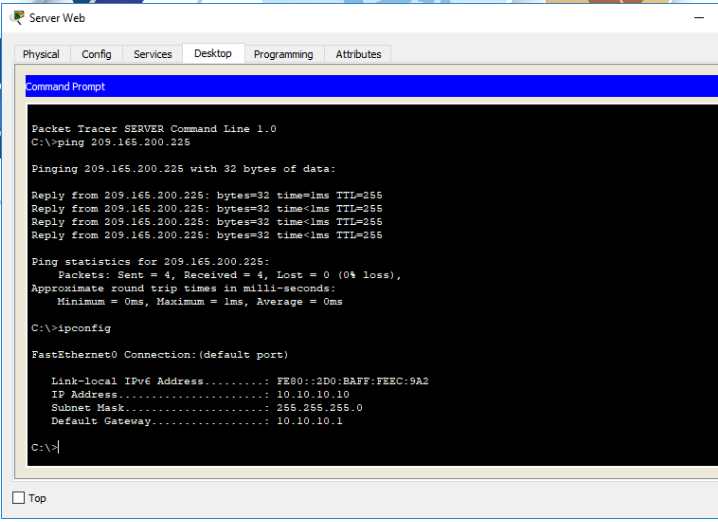
- Visualizar tablas de enrutamiento y routers conectados por OSPFv2
- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface

Packet Tracer no soporta este comando



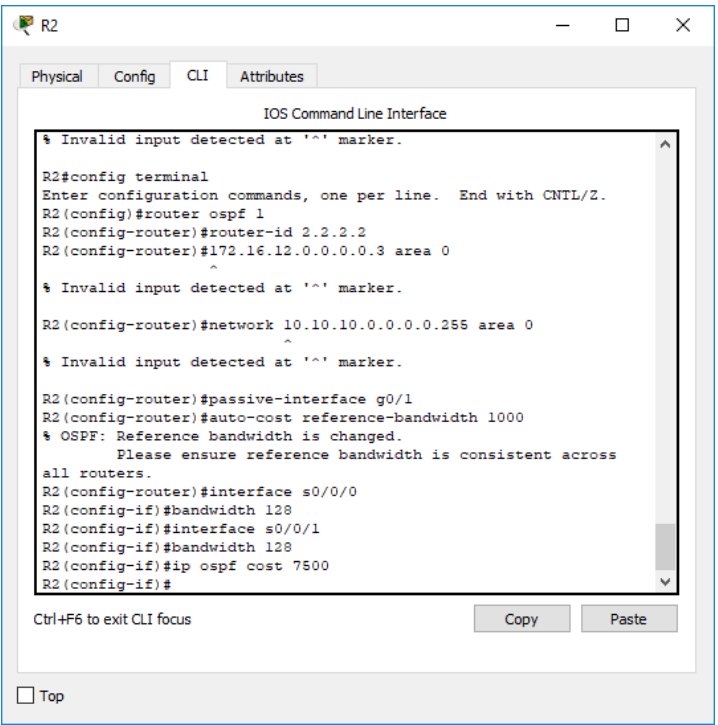
```
R1
Physical Config CLI Attributes
IOS Command Line Interface
Password:
R1>config terminal
^
% Invalid input detected at '^' marker.
R1>enable
Password:
R1#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#auto-cost reference-bandwidth 1000
^
% Invalid input detected at '^' marker.
R1(config-router)#exit
R1(config)#interface s0/0/0
R1(config-if)#bandwidth 128
^
% Invalid input detected at '^' marker.
R1(config-if)#bandwidth 128
R1(config-if)#ip ospf cost 7500
R1(config-if)#
Ctrl+F6 to exit CLI focus
Copy Paste
 Top
```

```
R2
Physical Config CLI Attributes
IOS Command Line Interface
acceso no autorizado
User Access Verification
Password:
R2>enable
Password:
R2#router ospf 1
^
% Invalid input detected at '^' marker.
R2#config 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)#172.16.12.0.0.0.0.3 area 0
^
% Invalid input detected at '^' marker.
R2(config-router)#network 10.10.10.0.0.0.0.255 area 0
^
% Invalid input detected at '^' marker.
R2(config-router)#
Ctrl+F6 to exit CLI focus
Copy Paste
 Top
```



```
ServerWeb
Physical Config Services Desktop Programming Attributes
Command Prompt
Packet Tracer SERVER Command Line 1.0
C:\>ping 209.165.200.225
Pinging 209.165.200.225 with 32 bytes of data:
Reply from 209.165.200.225: bytes=32 time=1ms TTL=255
Reply from 209.165.200.225: bytes=32 time<1ms TTL=255
Reply from 209.165.200.225: bytes=32 time<1ms TTL=255
Reply from 209.165.200.225: bytes=32 time<1ms 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 = 1ms, Average = 0ms
C:\>ipconfig
FastEthernet0 Connection: (default port)

Link-local IPv6 Address . . . . . : FE80::2D0:BAFF:FEEC:9A2
IP Address. . . . . : 10.10.10.10
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 10.10.10.1
C:\>
```



```
R2
Physical Config CLI Attributes
IOS Command Line Interface
% Invalid input detected at '^' marker.
R2#config 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)#172.16.12.0.0.0.0.3 area 0
^
% Invalid input detected at '^' marker.
R2(config-router)#network 10.10.10.0.0.0.0.255 area 0
^
% Invalid input detected at '^' marker.
R2(config-router)#passive-interface g0/1
R2(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across
all routers.
R2(config-router)#interface s0/0/0
R2(config-if)#bandwidth 128
R2(config-if)#interface s0/0/1
R2(config-if)#bandwidth 128
R2(config-if)#ip ospf cost 7500
R2(config-if)#
Ctrl+F6 to exit CLI focus
Copy Paste
```

### Configuración router 3

```
R3>enable
Password:
R3#config 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)#network 172.16.23.0.0.0.0.3 area 0

% Invalid input detected at '^' marker.

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 1000

% Invalid input detected at '^' marker.

R3(config-router)#exit
R3(config)# interface s0/0/1
R3(config-if)#bandwidth 128

% Invalid input detected at '^' marker.

R3(config-if)#bandwidth 128
R3(config-if)#
```

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

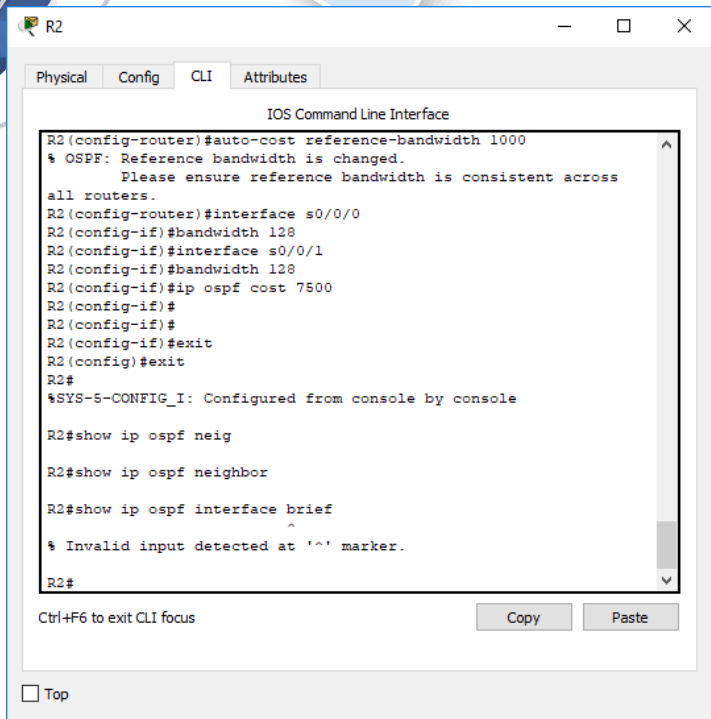
### Comando para visualizar OSPF

```
R2#
% Invalid input detected at '^' marker.

R2(config-router)#passive-interface g0/1
R2(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across
all routers.
R2(config-router)#interface s0/0/0
R2(config-if)#bandwidth 128
R2(config-if)#interface s0/0/1
R2(config-if)#bandwidth 128
R2(config-if)#ip ospf cost 7500
R2(config-if)#
R2(config-if)#
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

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

Lista de las interfaces en forma de resumen, packet tracer no soporta el comando



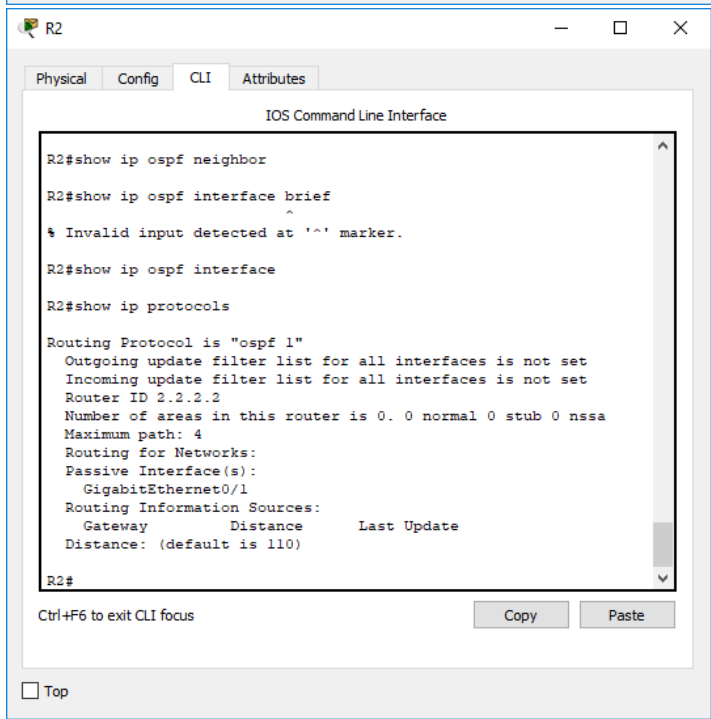
```
R2
Physical Config CLI Attributes
IOS Command Line Interface
R2(config-router)#auto-cost reference-bandwidth 1000
% OSPF: Reference bandwidth is changed.
Please ensure reference bandwidth is consistent across
all routers.
R2(config-router)#interface s0/0/0
R2(config-if)#bandwidth 128
R2(config-if)#interface s0/0/1
R2(config-if)#bandwidth 128
R2(config-if)#ip ospf cost 7500
R2(config-if)#
R2(config-if)#
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip ospf neig
R2#show ip ospf neighbor
R2#show ip ospf interface brief
^
% Invalid input detected at '^' marker.
R2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



```
R2
Physical Config CLI Attributes
IOS Command Line Interface
R2#show ip ospf neighbor
R2#show ip ospf interface brief
^
% Invalid input detected at '^' marker.
R2#show ip ospf interface
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 0. 0 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
  Passive Interface(s):
    GigabitEthernet0/1
  Routing Information Sources:
    Gateway         Distance         Last Update
  Distance: (default is 110)
R2#
```

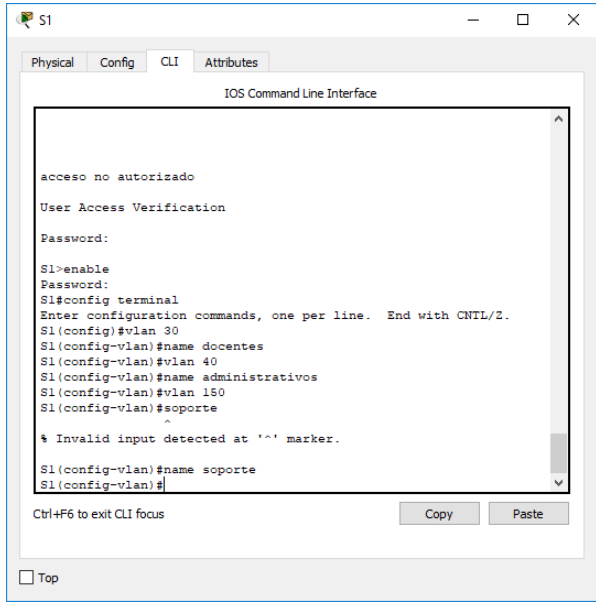
Ctrl+F6 to exit CLI focus

Copy Paste

Top

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

#### Creación de las vlan



```
S1
Physical Config CLI Attributes
IOS Command Line Interface

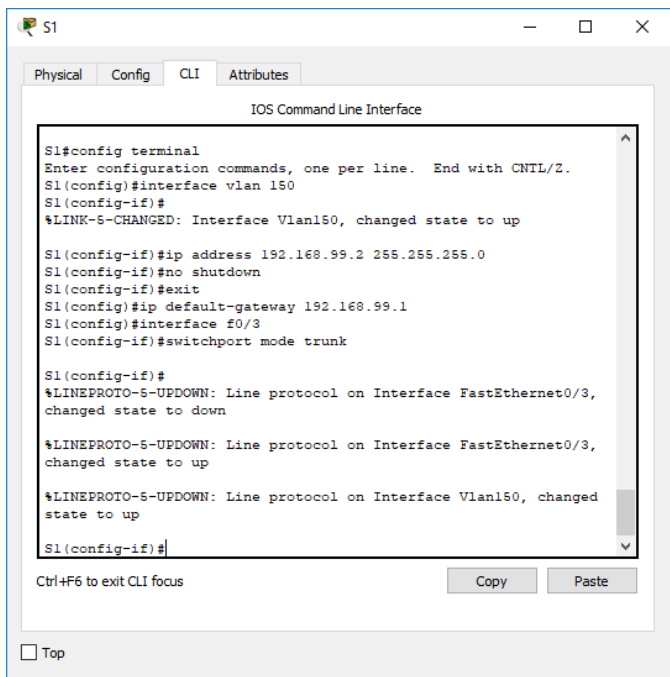
acceso no autorizado

User Access Verification

Password:

S1>enable
Password:
S1#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name docentes
S1(config-vlan)#vlan 40
S1(config-vlan)#name administrativos
S1(config-vlan)#vlan 150
S1(config-vlan)#soporte
^
% Invalid input detected at '^' marker.
S1(config-vlan)#name soporte
S1(config-vlan)#
```

#### Asignación de la IP y puerta de enlace al vlan soporte



```
S1
Physical Config CLI Attributes
IOS Command Line Interface

S1#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#interface vlan 150
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up

S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#interface 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 Vlan150, changed
state to up

S1(config-if)#
```

#### Configurar puertos de acceso al vlan

```
S1
Physical Config CLI Attributes
IOS Command Line Interface
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#interface 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 Vlan150, changed
state to up

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface range fa0/1-2, fa0/4, fa0/6-24, g1/1-2
interface range not validated - command rejected
S1(config)#interface range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#

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

Asignar puerto a la vlan 30 de docentes y apagar los puertos que no se usen

```
S1
Physical Config CLI Attributes
IOS Command Line Interface
S1(config-if)#switchport mode trunk

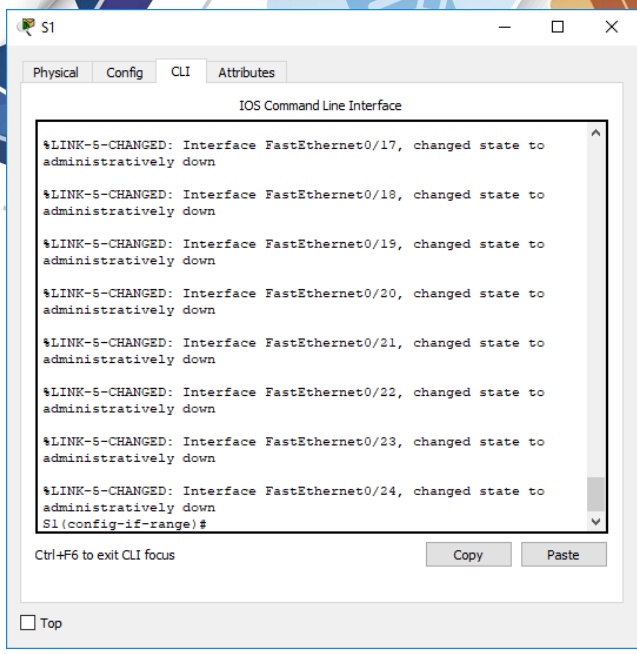
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to down

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

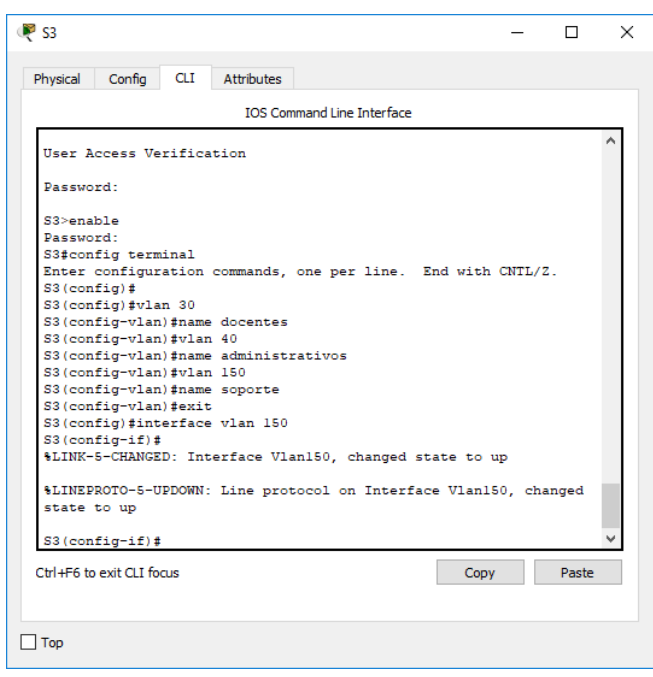
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface range fa0/1-2, fa0/4, fa0/6-24, g1/1-2
interface range not validated - command rejected
S1(config)#interface range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#interface fa0/6
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#interface range fa0/1-2, fa0/4, fa0/7-24
S1(config-if-range)#shutdown

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



Crear la base de datos de las vlan, asignar la ip y la puerta de enlace



```
S3>enable
Password:
S3#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
S3(config)#
S3(config)#vlan 30
S3(config-vlan)#name docentes
S3(config-vlan)#vlan 40
S3(config-vlan)#name administrativos
S3(config-vlan)#vlan 150
S3(config-vlan)#name soporte
S3(config-vlan)#exit
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up

S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#
```

```
S3(config-vlan)#name docentes
S3(config-vlan)#vlan 40
S3(config-vlan)#name administrativos
S3(config-vlan)#vlan 150
S3(config-vlan)#name soporte
S3(config-vlan)#exit
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up

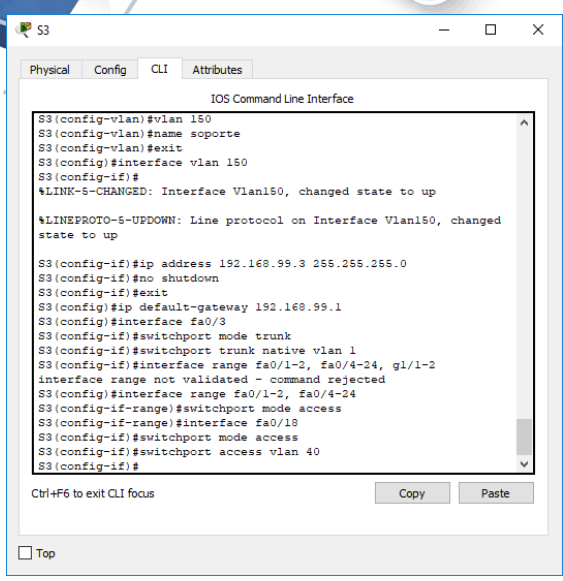
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#interface fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/1-2, fa0/4-24, g1/1-2
interface range not validated - command rejected
S3(config)#interface range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#
```

Asignar puerto a la vlan 40 y se apagan los puertos que no se usen

```
S3
Physical Config CLI Attributes
IOS Command Line Interface
S3(config-vlan)#name soporte
S3(config-vlan)#exit
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#interface fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/1-2, fa0/4-24, g1/1-2
interface range not validated - command rejected
S3(config)#interface range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/18
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#interface range fa0/1-2, fa0/4-17,fa0/19-24
S3(config-if-range)#shutdown
```

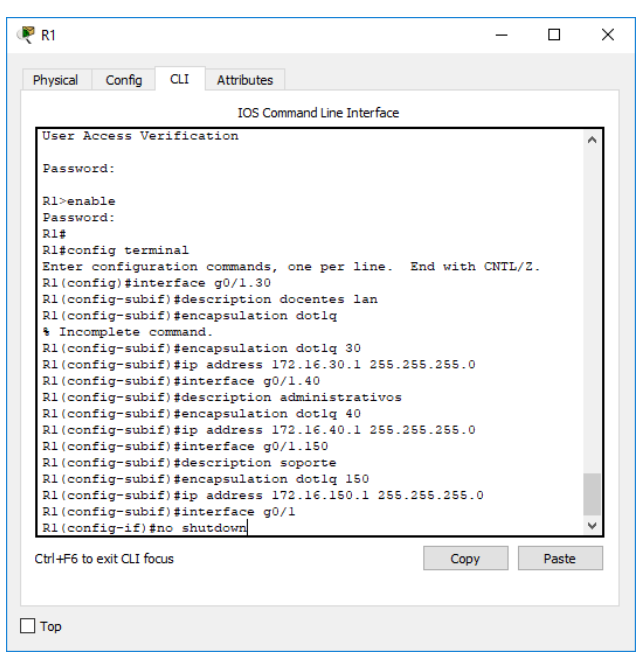
```
S3
Physical Config CLI Attributes
IOS Command Line Interface
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively 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
S3(config-if-range)#
```

## Configuración de la interface de la vlan

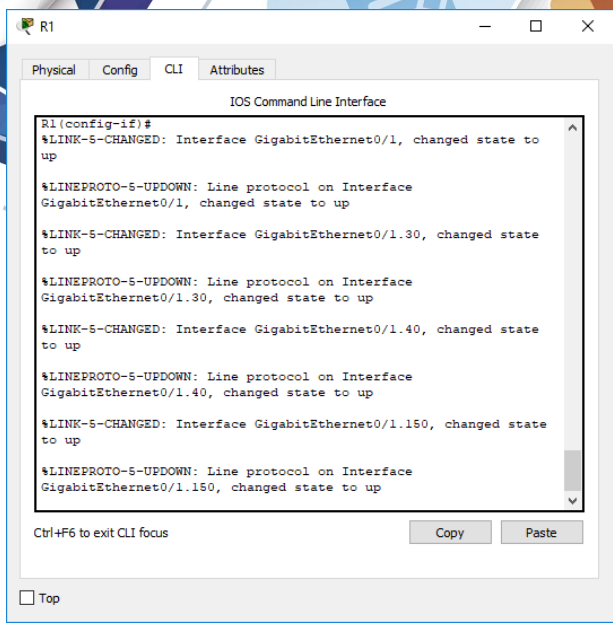


```
S3
S3(config-vlan)#vlan 150
S3(config-vlan)#name soporte
S3(config-vlan)#exit
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#interface fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/1-2, fa0/4-24, g1/1-2
interface range not validated - command rejected
S3(config)#interface range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/18
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#
```

## Encapsulamiento de las vlan



```
R1
User Access Verification
Password:
R1>enable
Password:
R1#
R1#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface g0/1.30
R1(config-subif)#description docentes lan
R1(config-subif)#encapsulation dot1q
% Incomplete command.
R1(config-subif)#encapsulation dot1q 30
R1(config-subif)#ip address 172.16.30.1 255.255.255.0
R1(config-subif)#interface g0/1.40
R1(config-subif)#description administrativos
R1(config-subif)#encapsulation dot1q 40
R1(config-subif)#ip address 172.16.40.1 255.255.255.0
R1(config-subif)#interface g0/1.150
R1(config-subif)#description soporte
R1(config-subif)#encapsulation dot1q 150
R1(config-subif)#ip address 172.16.150.1 255.255.255.0
R1(config-subif)#interface g0/1
R1(config-if)#no shutdown
```



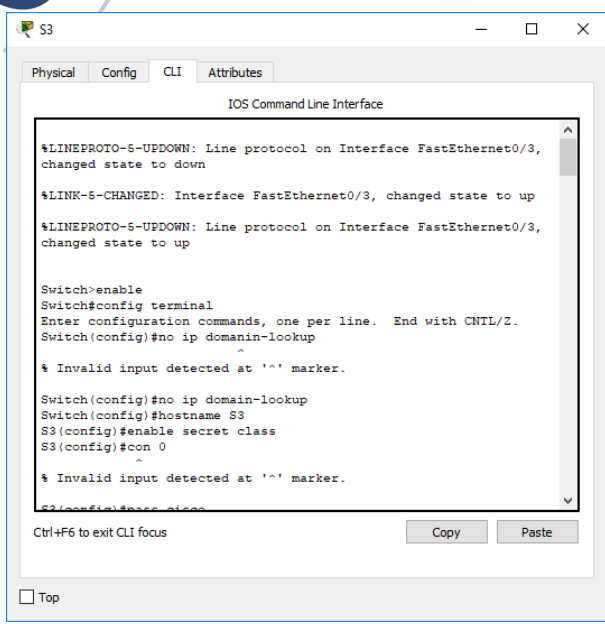
The screenshot shows a terminal window titled "R1" with tabs for "Physical", "Config", "CLI", and "Attributes". The active tab is "CLI", which displays the "IOS Command Line Interface". The terminal output shows a sequence of status messages for four interfaces: GigabitEthernet0/1, GigabitEthernet0/1.30, GigabitEthernet0/1.40, and GigabitEthernet0/1.150. For each interface, there is a message indicating the link state has changed to up, followed by a message indicating the line protocol has changed to up. At the bottom of the window, there is a "Ctrl+F6 to exit CLI focus" prompt and "Copy" and "Paste" buttons. A "Top" button is also visible at the bottom left of the window frame.

```
R1 (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  
%LINK-5-CHANGED: Interface GigabitEthernet0/1.30, changed state  
to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface  
GigabitEthernet0/1.30, changed state to up  
%LINK-5-CHANGED: Interface GigabitEthernet0/1.40, changed state  
to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface  
GigabitEthernet0/1.40, changed state to up  
%LINK-5-CHANGED: Interface GigabitEthernet0/1.150, changed state  
to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface  
GigabitEthernet0/1.150, changed state to up
```

Ctrl+F6 to exit CLI focus    Copy    Paste

Top

#### 4.- En el Switch 3 deshabilitar DNS lookup



```
S3
Physical Config CLI Attributes
IOS Command Line Interface

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

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

% Invalid input detected at '^' marker.

Switch(config)#no ip domain-lookup
Switch(config)#hostname S3
S3(config)#enable secret class
S3(config)#con 0

% Invalid input detected at '^' marker.

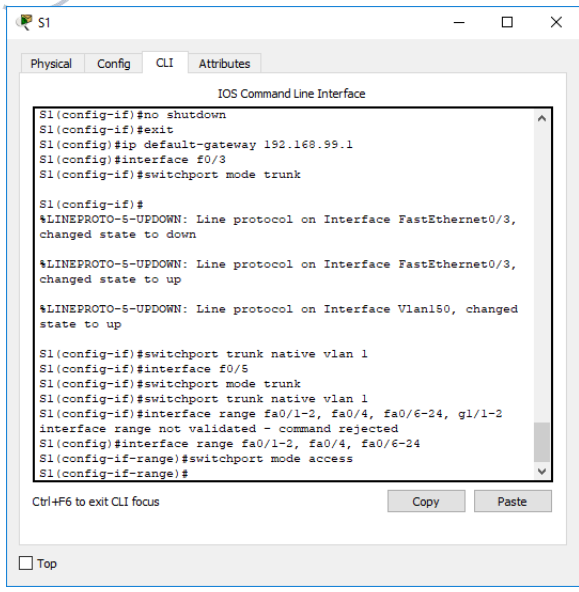
S3(config)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

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



The screenshot shows the CLI interface for switch S1. The configuration includes setting the default gateway to 192.168.99.1, configuring interface fa0/3 as a trunk port, and configuring interface fa0/5 as a trunk port with native VLAN 1. It also shows the configuration of interface ranges fa0/1-2, fa0/4, and fa0/6-24 as access ports.

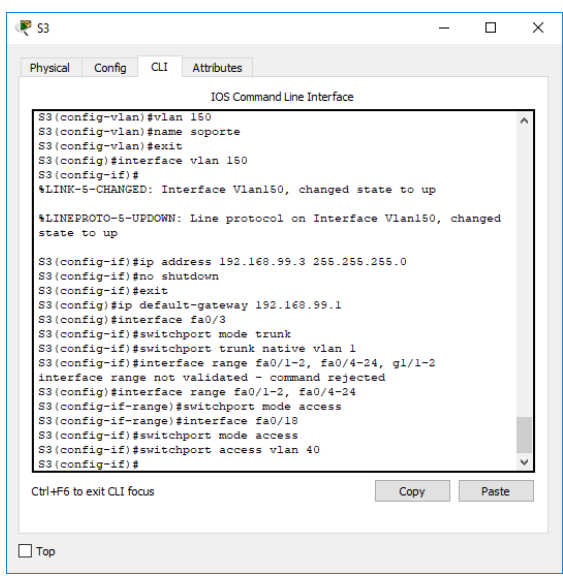
```
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#interface fa0/3
S1(config-if)#switchport mode trunk

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 Vlan150, changed
state to up

S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface fa0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface range fa0/1-2, fa0/4, fa0/6-24, g1/1-2
interface range not validated - command rejected
S1(config)#interface range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#
```



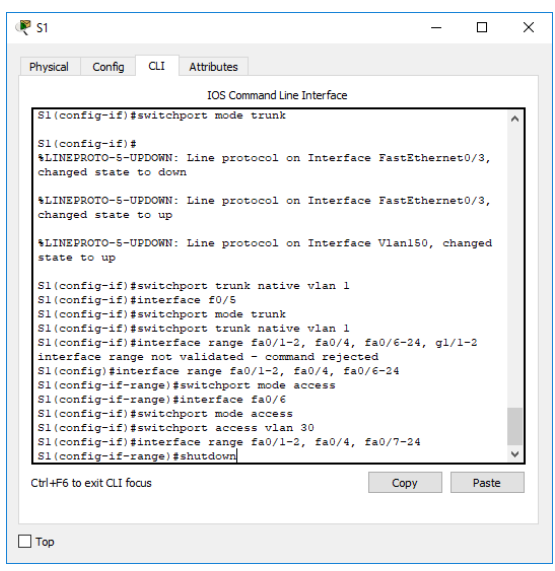
The screenshot shows the CLI interface for switch S3. The configuration includes creating VLAN 150 named 'soporte', configuring interface fa0/3 as a trunk port with native VLAN 1, and assigning IP addresses to interfaces fa0/18 and fa0/40. It also shows the configuration of interface ranges fa0/1-2, fa0/4-24, and fa0/6-24 as access ports.

```
S3(config-vlan)#vlan 150
S3(config-vlan)#name soporte
S3(config-vlan)#exit
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up

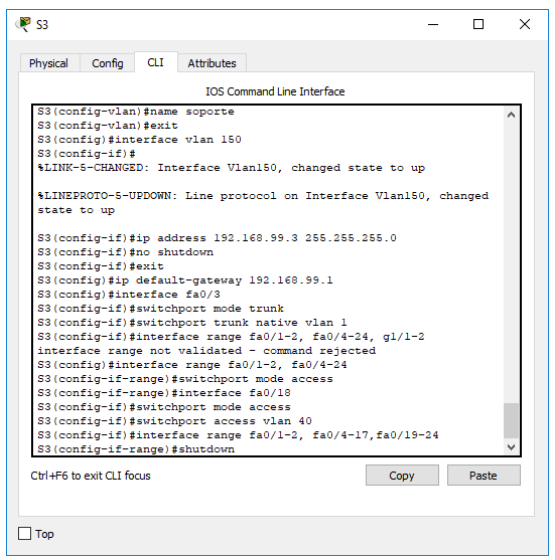
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#interface fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/1-2, fa0/4-24, g1/1-2
interface range not validated - command rejected
S3(config)#interface range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/18
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/40
S3(config-if-range)#switchport access vlan 40
S3(config-if-range)#
```

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



The screenshot shows the CLI configuration for switch S1. The configuration includes setting trunk ports, disabling protocols on unused interfaces, and configuring access ports. The final command is `S1(config-if-range)#shutdown`.

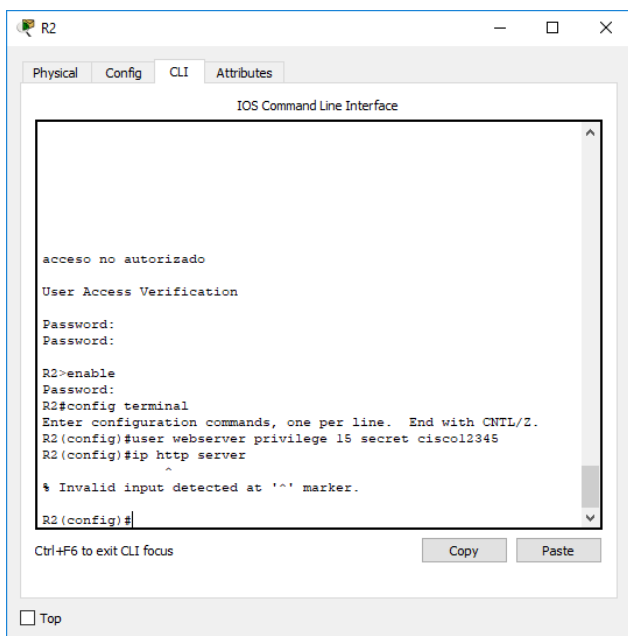
```
S1
Physical Config CLI Attributes
IOS Command Line Interface
S1(config-if)#switchport mode trunk
S1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface f0/5
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#interface range fa0/1-2, fa0/4, fa0/6-24, g1/1-2
interface range not validated - command rejected
S1(config)#interface range fa0/1-2, fa0/4, fa0/6-24
S1(config-if-range)#switchport mode access
S1(config-if-range)#interface fa0/6
S1(config-if-range)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#interface range fa0/1-2, fa0/4, fa0/7-24
S1(config-if-range)#shutdown
```



The screenshot shows the CLI configuration for switch S3. The configuration includes creating a VLAN, setting IP addresses, and configuring trunk and access ports. The final command is `S3(config-if-range)#shutdown`.

```
S3
Physical Config CLI Attributes
IOS Command Line Interface
S3(config-vlan)#name soporte
S3(config-vlan)#exit
S3(config)#interface vlan 150
S3(config-if)#
%LINK-5-CHANGED: Interface Vlan150, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan150, changed
state to up
S3(config-if)#ip address 192.168.99.3 255.255.255.0
S3(config-if)#no shutdown
S3(config-if)#exit
S3(config)#ip default-gateway 192.168.99.1
S3(config)#interface fa0/3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 1
S3(config-if)#interface range fa0/1-2, fa0/4-24, g1/1-2
interface range not validated - command rejected
S3(config)#interface range fa0/1-2, fa0/4-24
S3(config-if-range)#switchport mode access
S3(config-if-range)#interface fa0/18
S3(config-if-range)#switchport mode access
S3(config-if)#switchport access vlan 40
S3(config-if)#interface range fa0/1-2, fa0/4-17, fa0/19-24
S3(config-if-range)#shutdown
```

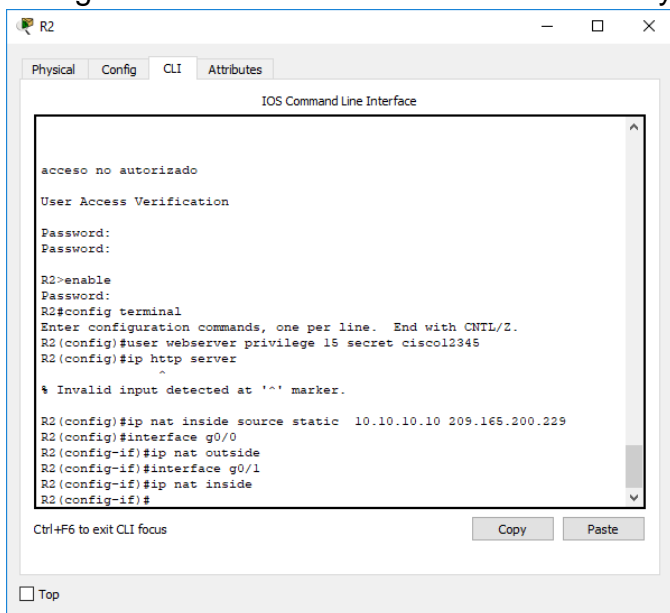
## 7.- Implementar DHCP y NAT para IPv4



```
R2
Physical Config CLI Attributes
IOS Command Line Interface

acceso no autorizado
User Access Verification
Password:
Password:
R2>enable
Password:
R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#user webserver privilege 15 secret cisco12345
R2(config)#ip http server
^
% Invalid input detected at '^' marker.
R2(config)#
```

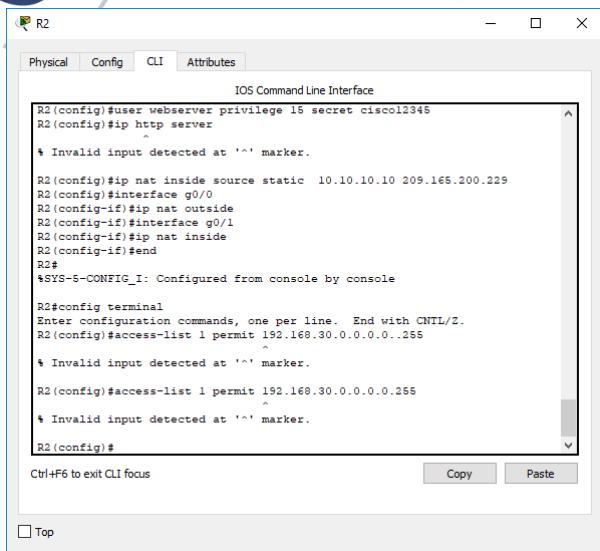
### Configuración de las interfaces estáticas de salida y entrada



```
R2
Physical Config CLI Attributes
IOS Command Line Interface

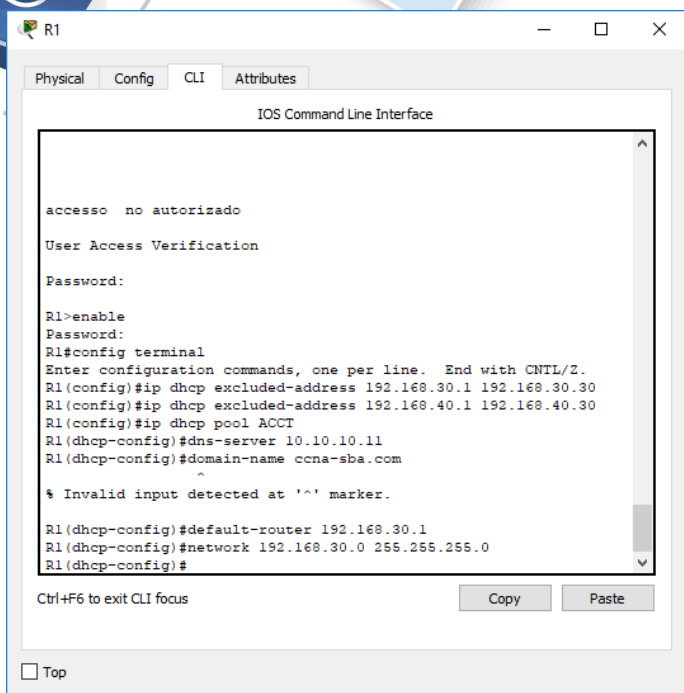
acceso no autorizado
User Access Verification
Password:
Password:
R2>enable
Password:
R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#user webserver privilege 15 secret cisco12345
R2(config)#ip http server
^
% Invalid input detected at '^' marker.
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#interface g0/0
R2(config-if)#ip nat outside
R2(config-if)#interface g0/1
R2(config-if)#ip nat inside
R2(config-if)#
```

## Configurar la nat dinámica para la lista de acceso 1



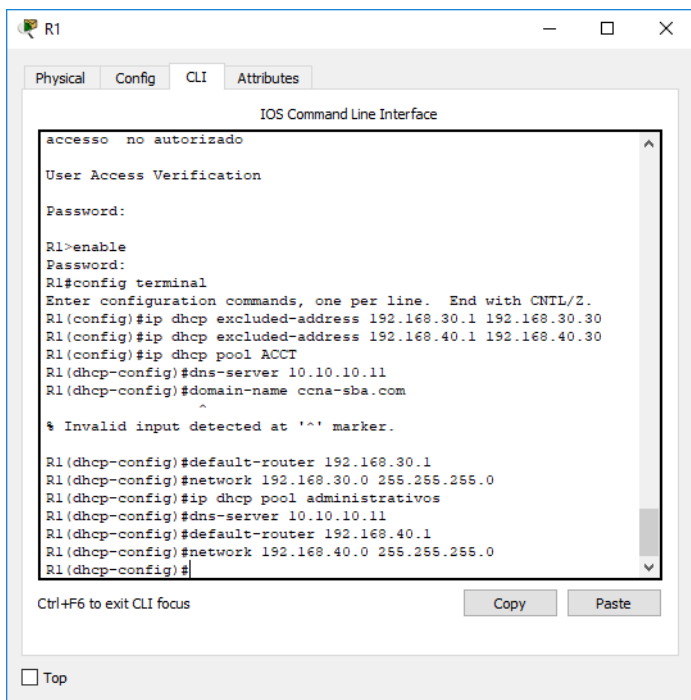
```
R2
Physical Config CLI Attributes
IOS Command Line Interface
R2(config)#user webserver privilege 15 secret cisco12345
R2(config)#ip http server
^
% Invalid input detected at '^' marker.
R2(config)#ip nat inside source static 10.10.10.10 209.165.200.229
R2(config)#interface g0/0
R2(config-if)#ip nat outside
R2(config-if)#interface g0/1
R2(config-if)#ip nat inside
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#access-list 1 permit 192.168.30.0.0.0.0.255
^
% Invalid input detected at '^' marker.
R2(config)#access-list 1 permit 192.168.30.0.0.0.0.255
^
% Invalid input detected at '^' marker.
R2(config)#
Ctrl+F6 to exit CLI focus
Copy Paste
Top
```

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



The screenshot shows the CLI of router R1. The user has entered the following commands to configure DHCP for VLAN 30:

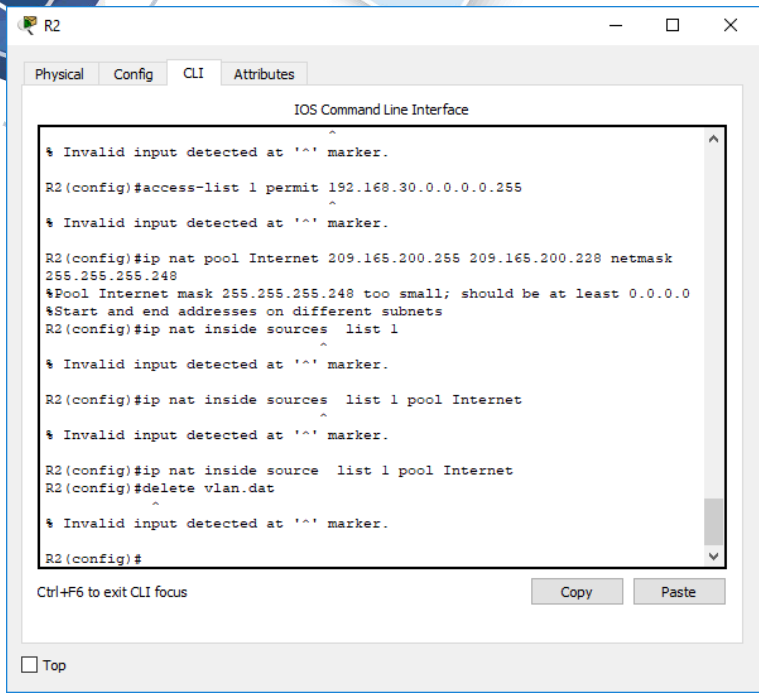
```
R1>enable
R1#config terminal
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#ip dhcp pool ACCT
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#domain-name ccna-sba.com
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#
```



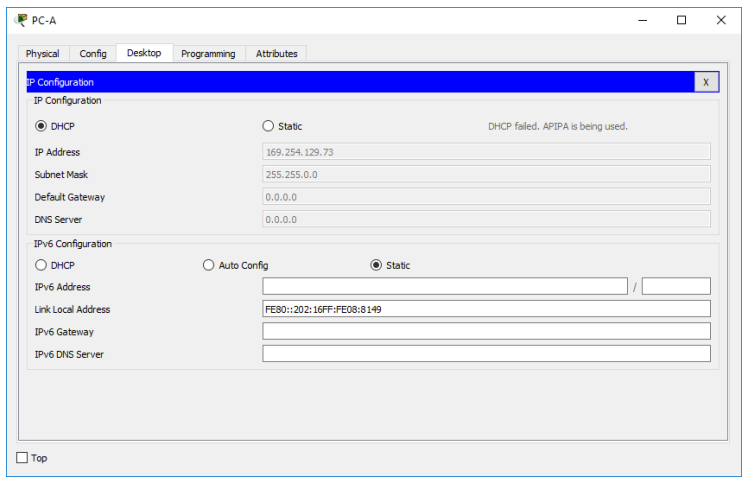
The screenshot shows the CLI of router R1. The user has entered the following commands to configure DHCP for VLAN 40:

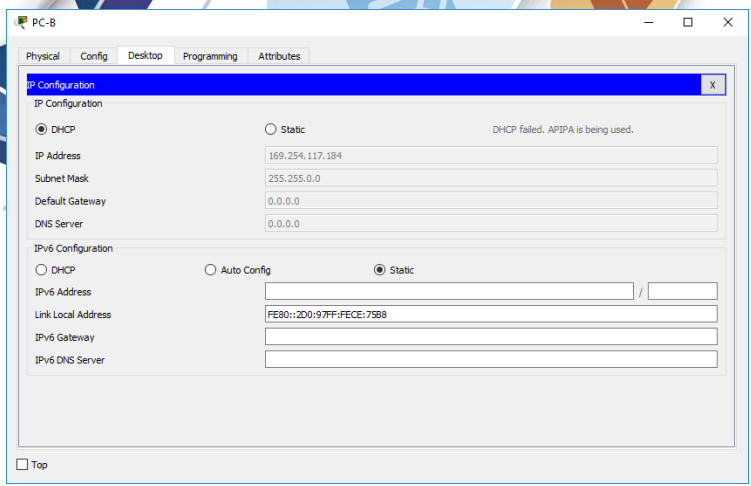
```
R1>enable
R1#config terminal
R1(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.30
R1(config)#ip dhcp excluded-address 192.168.40.1 192.168.40.30
R1(config)#ip dhcp pool ACCT
R1(dhcp-config)#dns-server 10.10.10.11
R1(dhcp-config)#domain-name ccna-sba.com
R1(dhcp-config)#default-router 192.168.30.1
R1(dhcp-config)#network 192.168.30.0 255.255.255.0
R1(dhcp-config)#ip dhcp pool administrativos
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)#
```

Se define el pool de direcciones dinámica

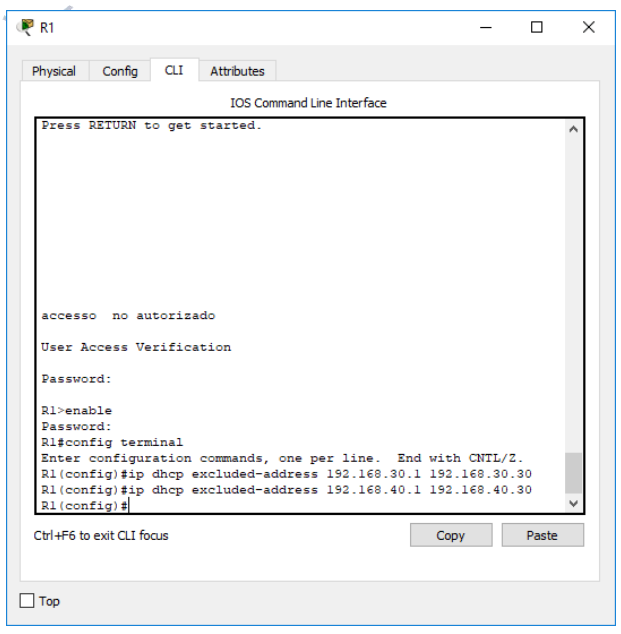


Verifica la configuración dhcp





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



<p>Configurar DHCP pool para VLAN 30</p>	<p>Name: DOCENTES          DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.</p>
<p>Configurar DHCP pool para VLAN 40</p>	<p>Name: ADMINISTRATIVOS          DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.</p>

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

```
acceso no autorizado
User Access Verification
Password:
Password:

R2>enable
Password:
R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#user webserver 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)#interface g0/0
R2(config-if)#ip nat outside
R2(config-if)#interface g0/1
R2(config-if)#ip nat inside
R2(config-if)#
```

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

```
R2
Physical Config CLI Attributes
IOS Command Line Interface

acceso no autorizado
User Access Verification
Password:
R2>enable
Password:
R2#ip access-list standard
^
% Invalid input detected at '^' marker.

R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2 (config)#ip access-list standard Administrator
R2 (config-std-nacl)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

```
R2
Physical Config CLI Attributes
IOS Command Line Interface

acceso no autorizado
User Access Verification
Password:
R2>enable
Password:
R2#ip access-list standard
^
% Invalid input detected at '^' marker.

R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2 (config)#ip access-list standard Administrator
R2 (config-std-nacl)#permit host 172.16.12.1
R2 (config-std-nacl)#exit
R2 (config)#telnet vty 0 4
^
% Invalid input detected at '^' marker.

R2 (config)#line vty 0 4
R2 (config-line)#access-class administrator in
R2 (config-line)#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

## Verificación de la restricción en la comunicación

```
R1
Physical Config CLI Attributes
IOS Command Line Interface
administratively down down
Vlan1 unassigned YES NVRAM
administratively down down
R1#telnet 172.06.12.1
Trying 172.6.12.1 ...
% Connection timed out; remote host not responding
R1#telnet 172.06.12.1
Trying 172.6.12.1 ...
% Connection timed out; remote host not responding
R1#telnet 172.16.12.1
Trying 172.16.12.1 ...Openacesso no autorizado

User Access Verification

Password:
Password:
Password:
R1>enable
Password:
R1#
R1#exit

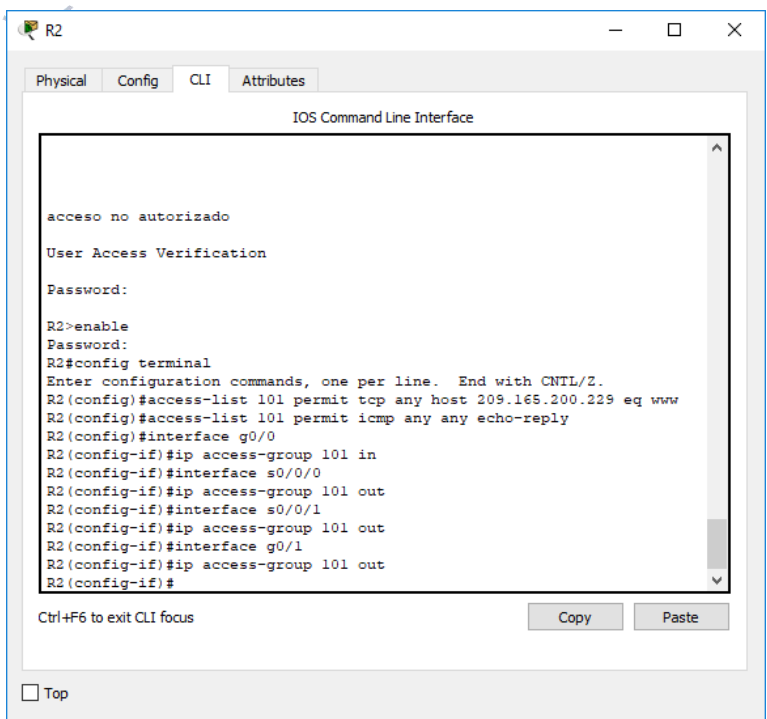
[Connection to 172.16.12.1 closed by foreign host]
R1#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

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

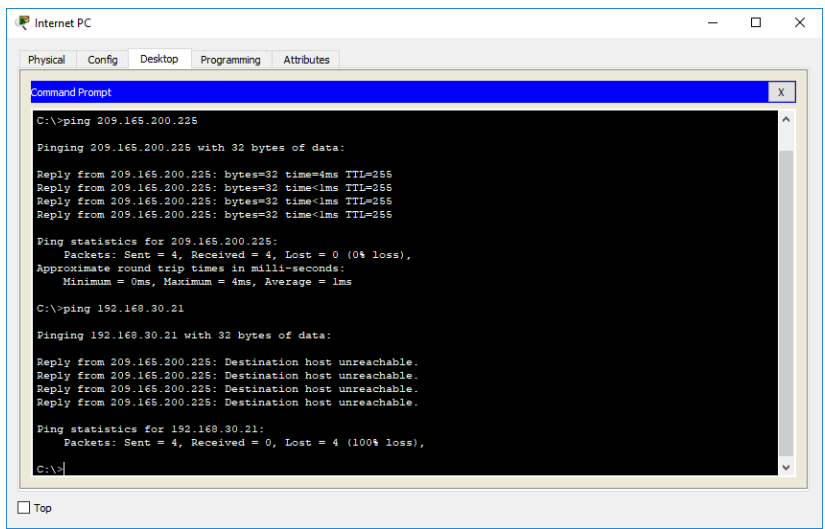


```
IOS Command Line Interface

acceso no autorizado
User Access Verification
Password:
R2>enable
Password:
R2#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
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)#interface g0/0
R2(config-if)#ip access-group 101 in
R2(config-if)#interface s0/0/0
R2(config-if)#ip access-group 101 out
R2(config-if)#interface s0/0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#interface g0/1
R2(config-if)#ip access-group 101 out
R2(config-if)#
```

Se verifica que los acl funcionen correctamente

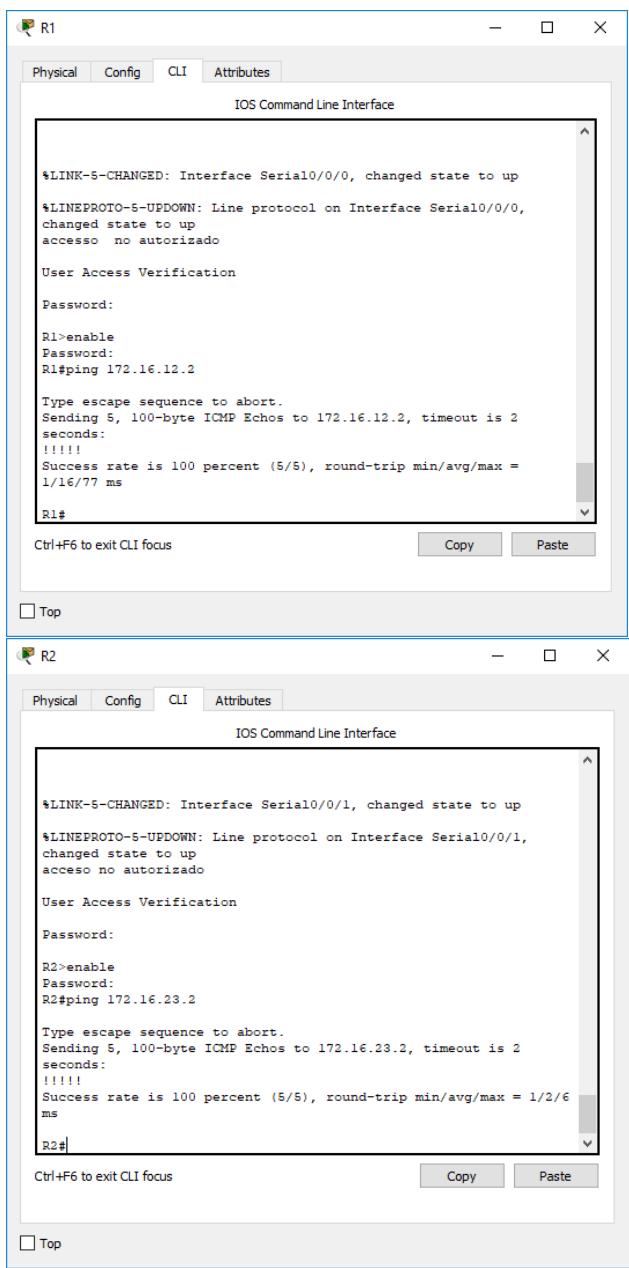
Pings inalcanzables



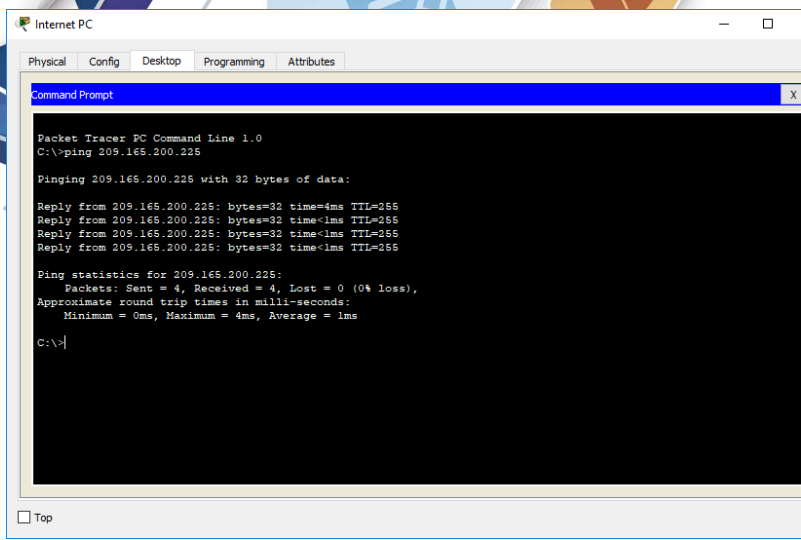
```
Command Prompt
C:\>ping 209.165.200.225
Pinging 209.165.200.225 with 32 bytes of data:
Reply from 209.165.200.225: bytes=32 time=4ms TTL=255
Reply from 209.165.200.225: bytes=32 time<1ms TTL=255
Reply from 209.165.200.225: bytes=32 time<1ms TTL=255
Reply from 209.165.200.225: bytes=32 time<1ms TTL=255
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 = 4ms, Average = 1ms
C:\>ping 192.168.30.21
Pinging 192.168.30.21 with 32 bytes of data:
Reply from 209.165.200.225: Destination host unreachable.
Reply from 209.165.200.225: Destination host unreachable.
Reply from 209.165.200.225: Destination host unreachable.
Reply from 209.165.200.225: Destination host unreachable.
Ping statistics for 192.168.30.21:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
```

### 13.- Verificar procesos de comunicación y Re direccionamiento de tráfico en los routers mediante el uso de Ping y Traceroute.

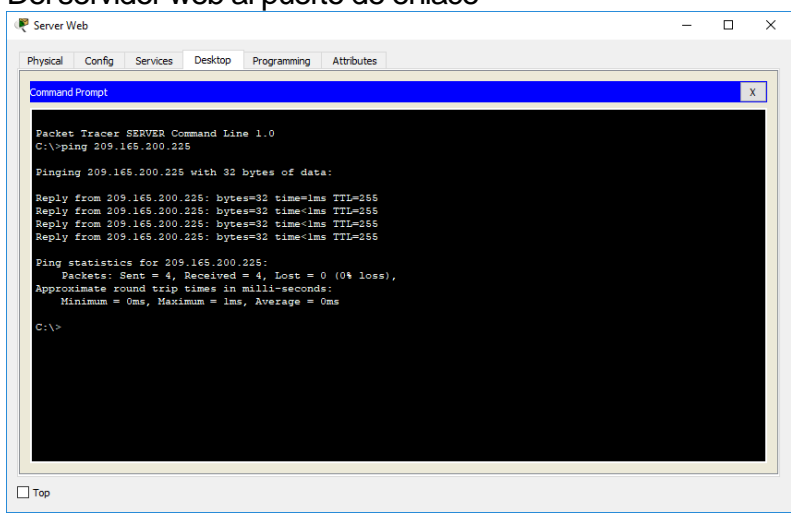
Se realizan verificación con el comando ping par algunas conexiones

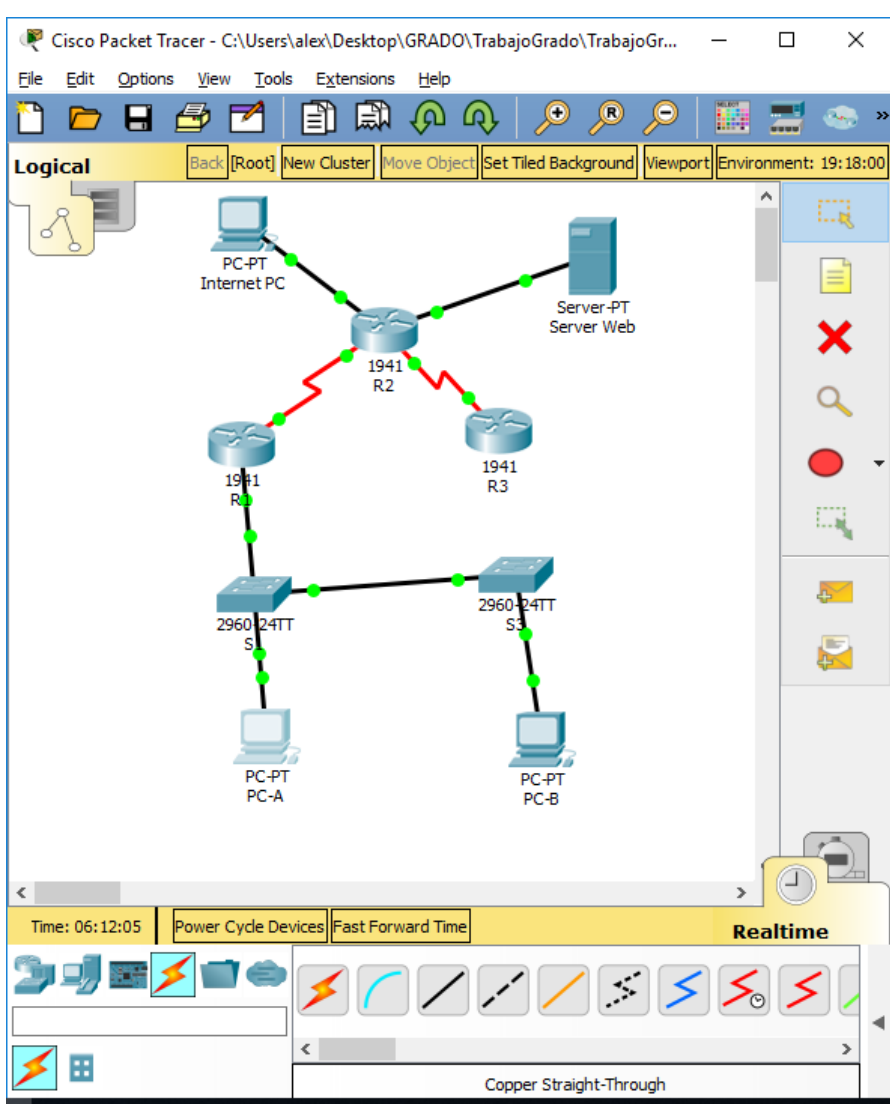
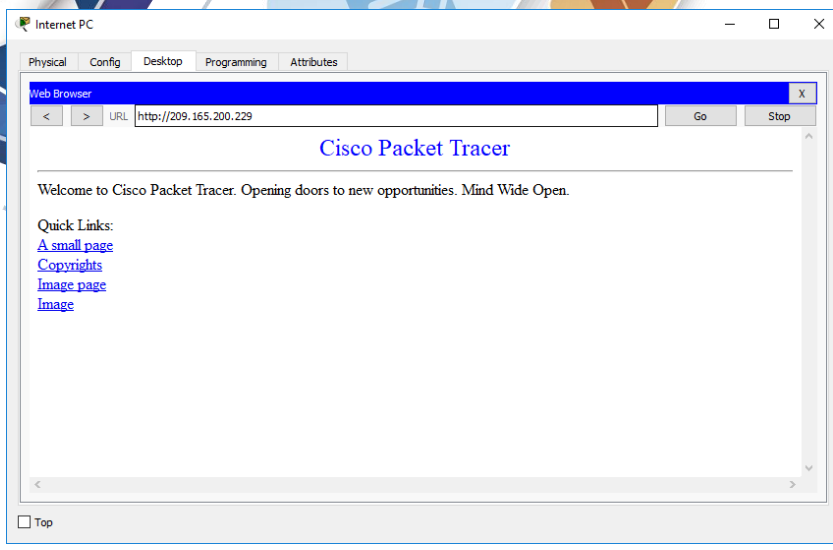


Equipo de internet al puerto de enlace



### Del servidor web al puerto de enlace








## CONCLUSIONES

Aprendimos los conceptos básicos de configuración de lo router y switches para la configuración de redes Lan o Wan, aplicando las distintas formas de configuración como son la VLAN, NAT realizando con IP estáticas o dinámicas, según las necesidades o requerimientos de la red, estamos en la capacidad de saber instalar y configuración una red.





## REFERENCIAS BIBLIOGRAFICAS

Temática: Configuración y conceptos básicos de Switching CISCO. (2014). Configuración y conceptos básicos de Switching. Principios de Enrutamiento y Conmutación. Recuperado de:

<https://static-courseassets.s3.amazonaws.com/RSE50ES/module2/index.html#2.0.1.1>

Temática: VLANs CISCO. (2014). VLANs. Principios de Enrutamiento y Conmutación. Recuperado de:

<https://static-course-assets.s3.amazonaws.com/RSE50ES/module3/index.html#3.0.1.1>

Temática: Conceptos de Routing 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>

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

Temática: Enrutamiento Estático CISCO. (2014). Enrutamiento Estático. Principios de Enrutamiento y Conmutación. Recuperado de:

<https://static-courseassets.s3.amazonaws.com/RSE50ES/module6/index.html#6.0.1.1>

