



PRUEBA DE HABILIDADES PRÁCTICAS CCNA

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Marzo 2019

BOGOTA





INDICE

Abstrac

Introducción

Escenario 1

Tabla de direccionamiento

Tabla de asignación de VLAN y Puertos

Tabla de enlaces Troncales

Situación

Descripción de las actividades y Solución estudio de Caso



ABSTRAC

During the last semester we worked with the advice of our tutor, and the reading of the material provided by Cisco Networking Academy going into the different cases and examples of configuration of telecommunications devices where practices were carried out through the Cisco Packet Tracer application giving solution to different cases and problems in a real environment this did not recognize the different devices along with their functions such as ping, show, ip, route, tracerouter and their management.

Through the following exercises we will test the knowledge and skills obtained through the execution of the described problems giving the correct solution.

INTRODUCCION

La introducción de las tecnologías de la informática y las comunicaciones en el proceso de enseñanza y aprendizaje adquiere cada día mayor importancia por el impacto positivo que tiene. El avance en nuestra sociedad de las redes de computadoras ha generado una verdadera evolución en el estudio y trabajo de estas, los sistemas de comunicación juegan un papel importante ya que cada día se hace más fácil acceder a la información mediante sistemas de información que nos permite tener acceso y comunicación para obtener el conocimiento necesario para analizarlo y ponerlo en práctica para sobresalir y conocer la situación y el empleo de las mismas.

El objetivo del presente trabajo consiste en realizar prácticas con el fin de tener en cuenta aspectos básicos de networking, como también temas fundamentales de la comunicación y las redes de area local (LAN) y redes de area extensa (WAN) vistas durante el proceso de formación sobre el tema.

En las prácticas se utilizaron herramientas como equipos, dispositivos routers, switch, servidores y cables trenzado y directo, con el fin de lograr la simulación en Packet Tracer.

La solución del presente trabajo mediante la estrategia de aprendizaje basado en Tareas favorece el desarrollo de competencias y se nota una planeación al tener un orden lógico de ejecución claramente establecidos, facilitando el proceso de aprendizaje a través de espacios e interacción.

Descripción de escenarios propuestos para la prueba de habilidades

Escenario 1

Tabla de direccionamiento

El administrador	Interfaces	Dirección IP	Máscara de subred	Gateway predeterminado
ISP	S0/0/0	200.123.211.1	255.255.255.0	N/D
R1	Se0/0/0	200.123.211.2	255.255.255.0	N/D
	Se0/1/0	10.0.0.1	255.255.255.252	N/D
	Se0/1/1	10.0.0.5	255.255.255.252	N/D
R2	Fa0/0,100	192.168.20.1	255.255.255.0	N/D
	Fa0/0,200	192.168.21.1	255.255.255.0	N/D
	Se0/0/0	10.0.0.2	255.255.255.252	N/D
	Se0/0/1	10.0.0.9	255.255.255.252	N/D
R3	Fa0/0	192.168.30.1	255.255.255.0	N/D
		2001:db8:130::9C0:80F:301	/64	N/D
	Se0/0/0	10.0.0.6	255.255.255.252	N/D
	Se0/0/1	10.0.0.10	255.255.255.252	N/D
SW2	VLAN 100	N/D	N/D	N/D
	VLAN 200	N/D	N/D	N/D
SW3	VLAN1	N/D	N/D	N/D

PC20	NIC	DHCP	DHCP	DHCP
PC21	NIC	DHCP	DHCP	DHCP
PC30	NIC	DHCP	DHCP	DHCP
PC31	NIC	DHCP	DHCP	DHCP
Laptop20	NIC	DHCP	DHCP	DHCP
Laptop21	NIC	DHCP	DHCP	DHCP
Laptop30	NIC	DHCP	DHCP	DHCP

Laptop31	NIC	DHCP	DHCP	DHCP
----------	-----	------	------	------

Tabla de asignación de VLAN y de puertos

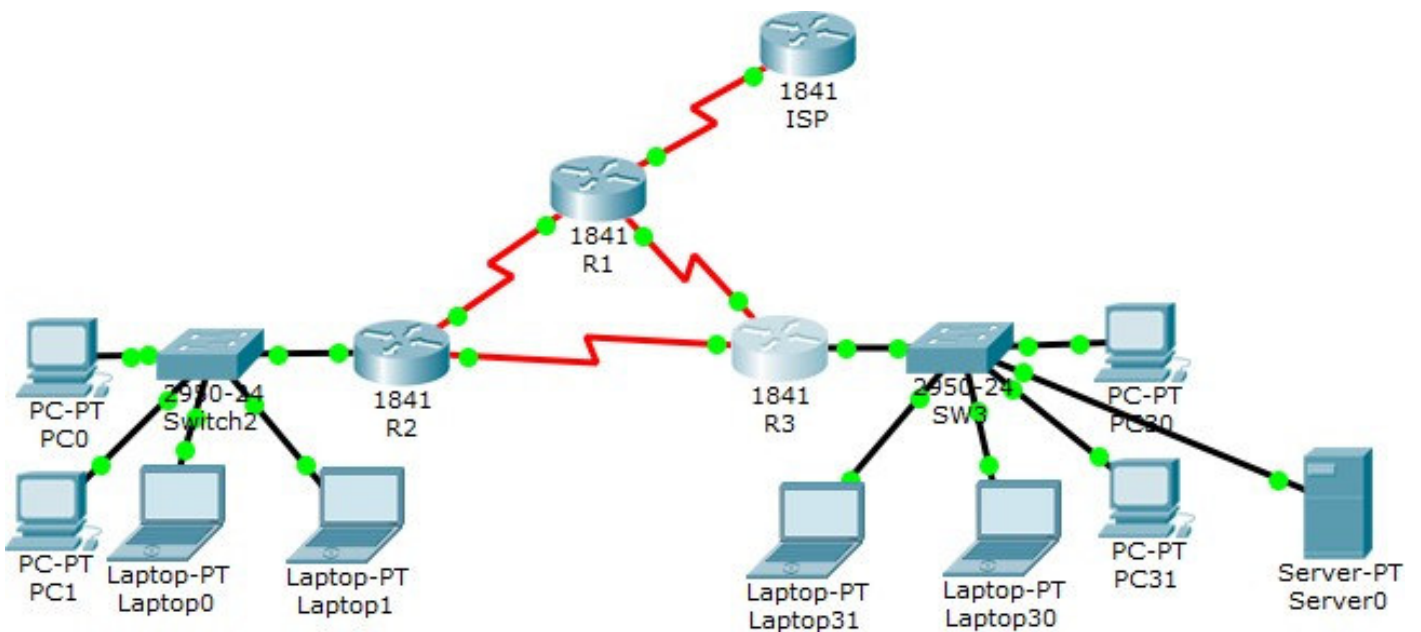
Dispositivo	VLAN	Nombre	Interfaz
SW2	100	LAPTOPS	Fa0/2-3
SW2	200	DESTOPS	Fa0/4-5
SW3	1	-	Todas las interfaces

Tabla de enlaces troncales

Dispositivo local	Interfaz local	Dispositivo remoto
SW2	Fa0/2-3	100

Situación

En esta actividad, demostrará y reforzará su capacidad para implementar NAT, servidor de DHCP, RIPV2 y el routing entre VLAN, incluida la configuración de direcciones IP, las VLAN, los enlaces troncales y las subinterfaces. Todas las pruebas de alcance deben realizarse a través de ping únicamente.



```
ISP>enable
```

```
ISP#conf
```

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

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

```
ISP(config)#int s0/0/0
```

```
ISP(config-if)#ip address 200.123.211.1 255.255.255.0
```

```
ISP(config-if)#no shut
```

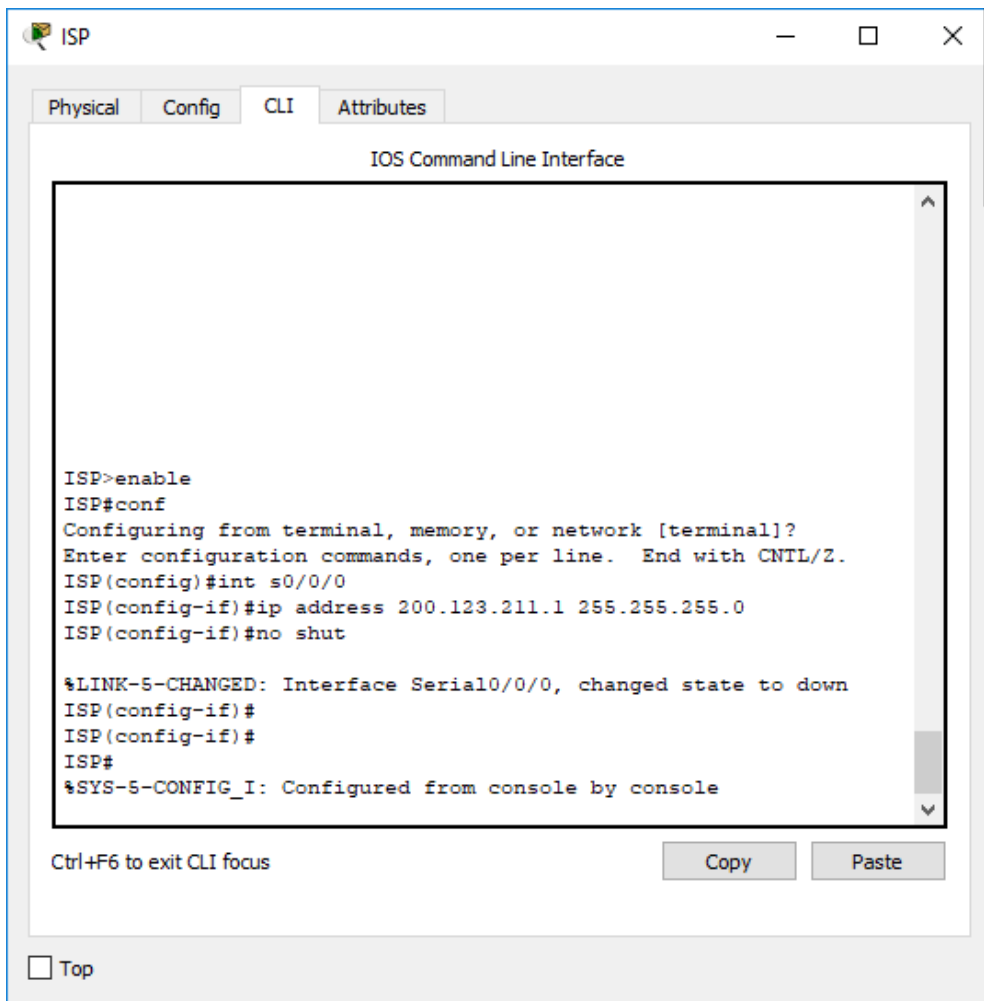
```
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
```

```
ISP(config-if)#
```

```
ISP(config-if)#
```

```
ISP#
```

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



The screenshot shows a terminal window titled "ISP" with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the "IOS Command Line Interface" with the following text:

```
ISP>enable
ISP#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
ISP(config)#int s0/0/0
ISP(config-if)#ip address 200.123.211.1 255.255.255.0
ISP(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
ISP(config-if)#
ISP(config-if)#
ISP#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the terminal window, there is a "Ctrl+F6 to exit CLI focus" message, "Copy" and "Paste" buttons, and a "Top" button.

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

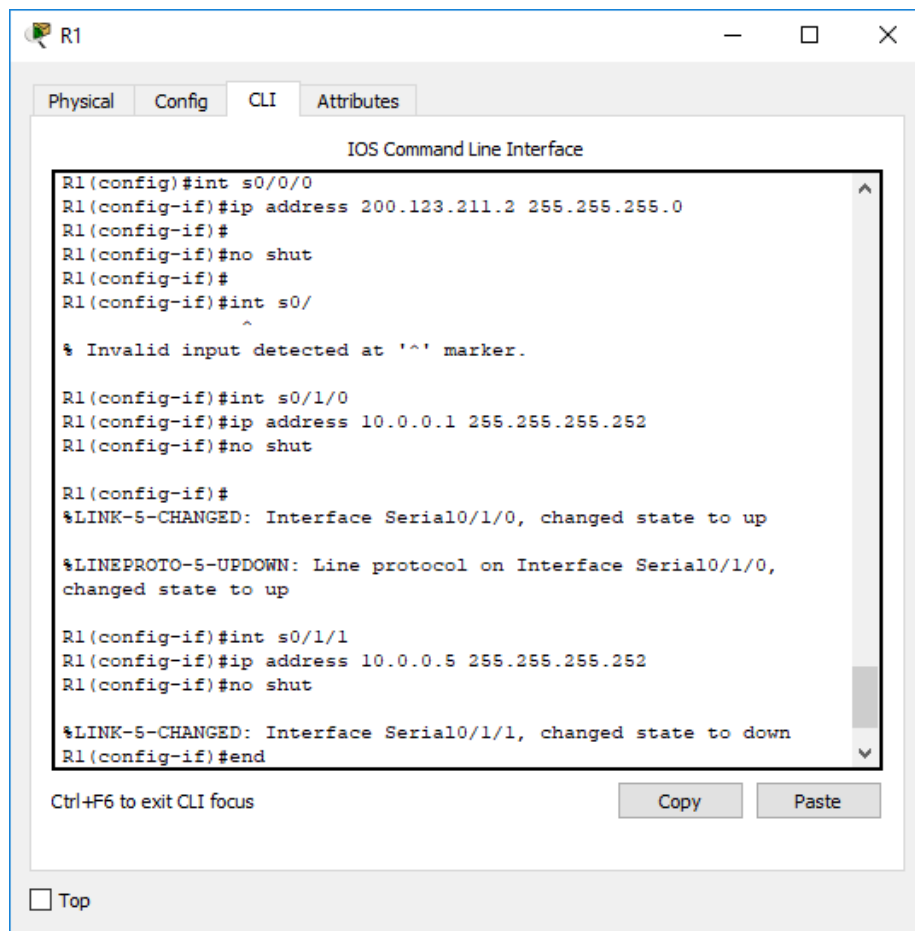
```
R1(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
```

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

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

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

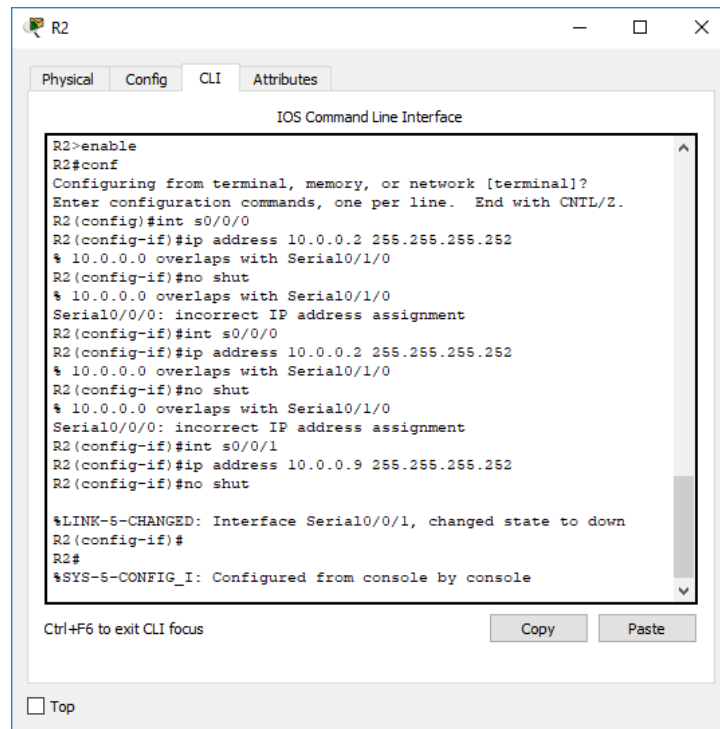
```
%SYS-5-CONFIG_I: Configured from console by console
```




```
R2>enable
R2#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int s0/0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
% 10.0.0.0 overlaps with Serial0/1/0
R2(config-if)#no shut
% 10.0.0.0 overlaps with Serial0/1/0
Serial0/0/0: incorrect IP address assignment
R2(config-if)#int s0/0/0
R2(config-if)#ip address 10.0.0.2 255.255.255.252
% 10.0.0.0 overlaps with Serial0/1/0
R2(config-if)#no shut
% 10.0.0.0 overlaps with Serial0/1/0
Serial0/0/0: incorrect IP address assignment
R2(config-if)#int s0/0/1
R2(config-if)#ip address 10.0.0.9 255.255.255.252
R2(config-if)#no shut
```

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

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



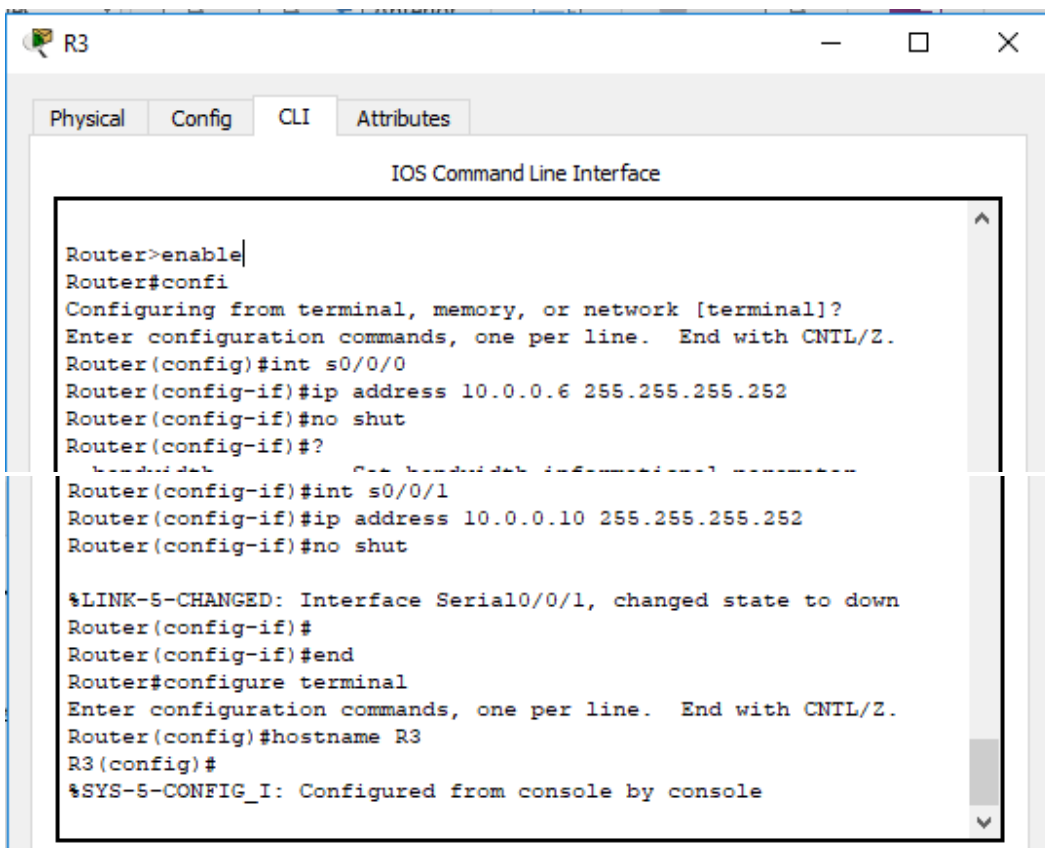
```

Router>enable
Router#confi
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 10.0.0.6 255.255.255.252
Router(config-if)#no shut
Router(config-if)#?
Router(config-if)#int s0/0/1
Router(config-if)#ip address 10.0.0.10 255.255.255.252
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#
Router(config-if)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3
R3(config)#

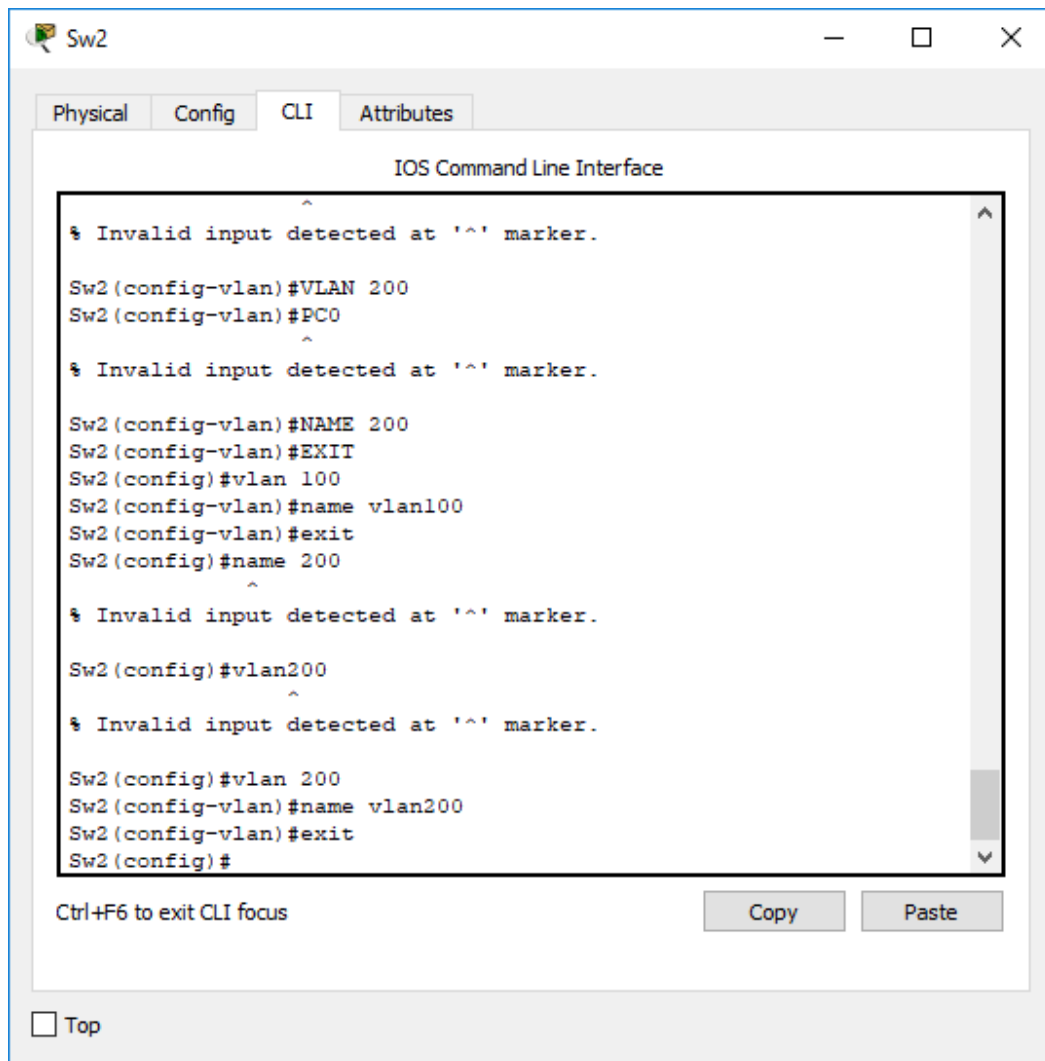
%SYS-5-CONFIG_I: Configured from console by console

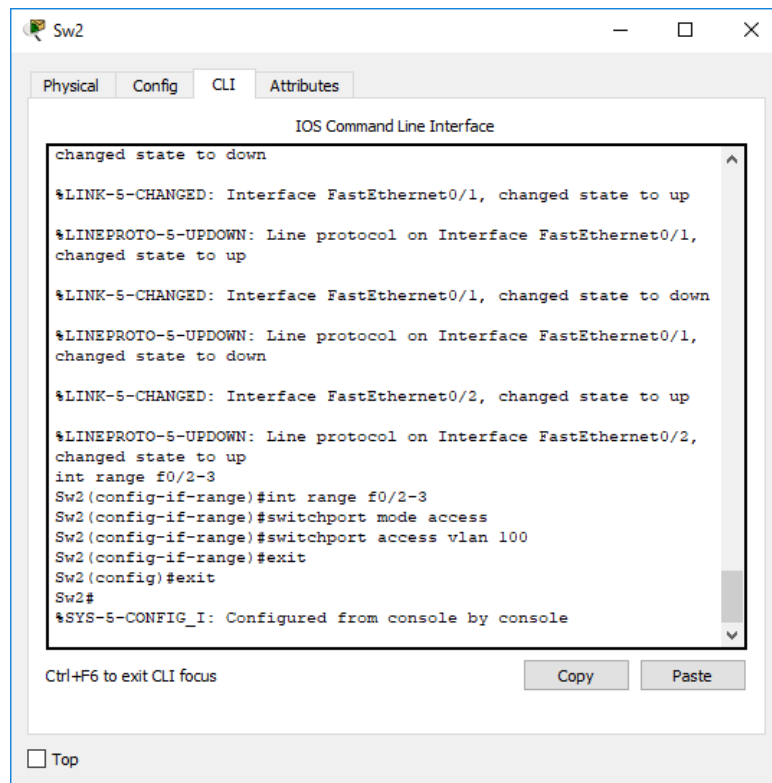
```



Descripción de las actividades

- **SW1** VLAN y las asignaciones de puertos de VLAN deben cumplir con la tabla 1. Se habilitan las vlan 100 y 200.





Sw2

Physical Config CLI Attributes

IOS Command Line Interface

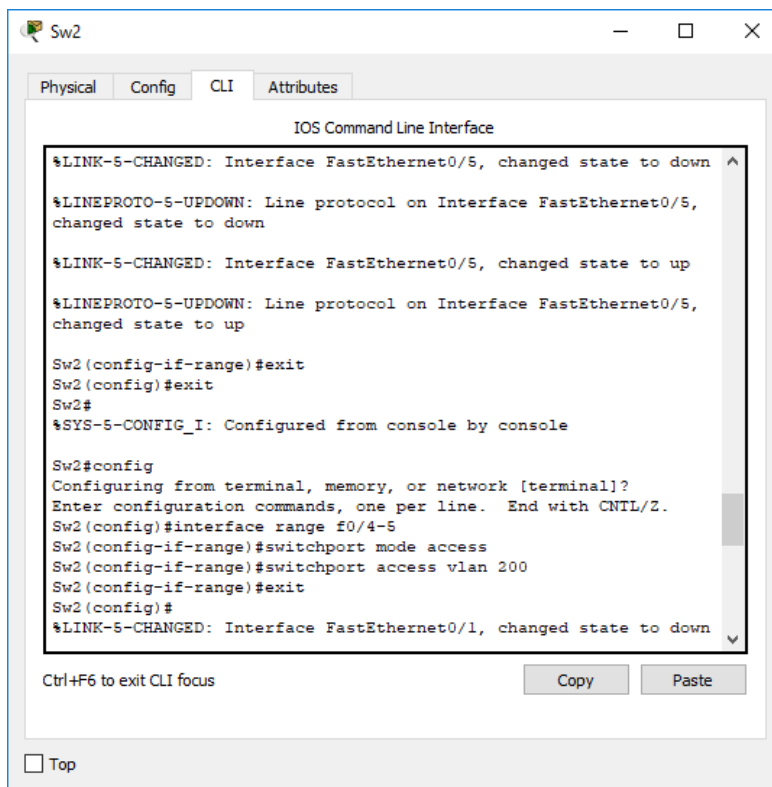
```

changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2,
changed state to up
int range f0/2-3
Sw2(config-if-range)#int range f0/2-3
Sw2(config-if-range)#switchport mode access
Sw2(config-if-range)#switchport access vlan 100
Sw2(config-if-range)#exit
Sw2(config)#exit
Sw2#
%SYS-5-CONFIG_I: Configured from console by console
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



Sw2

Physical Config CLI Attributes

IOS Command Line Interface

```

%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5,
changed state to down
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5,
changed state to up
Sw2(config-if-range)#exit
Sw2(config)#exit
Sw2#
%SYS-5-CONFIG_I: Configured from console by console

Sw2#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Sw2(config)#interface range f0/4-5
Sw2(config-if-range)#switchport mode access
Sw2(config-if-range)#switchport access vlan 200
Sw2(config-if-range)#exit
Sw2(config)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

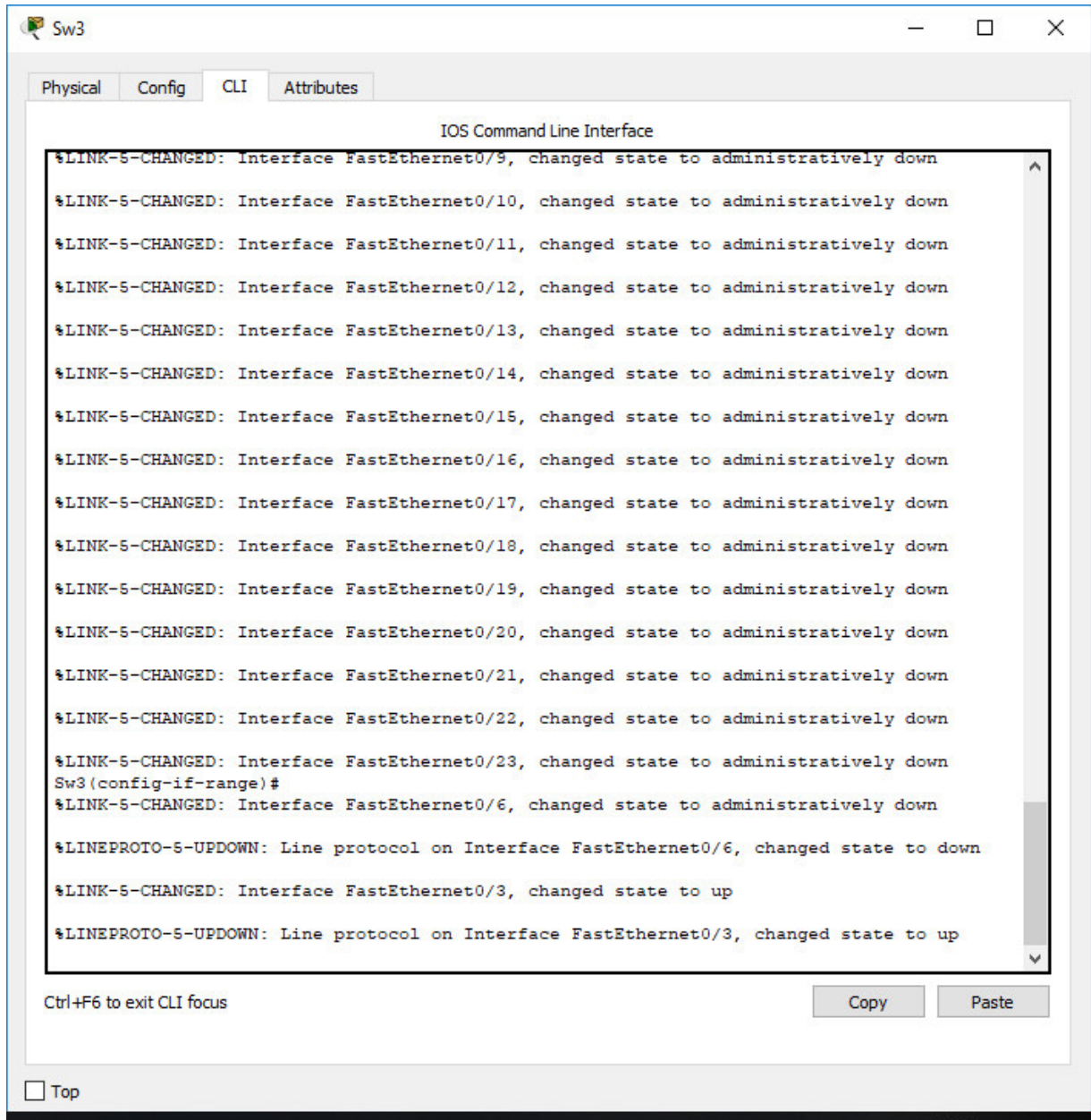
Top

- Los puertos de red que no se utilizan se deben deshabilitar.

```
Sw2(Config-If)#shutdown
%LINK-5-CHANGED: Interface FastEthernet0/8, changed state to
administratively down
Sw2(config-if)#interface fastEthernet 0/8-24
^
% Invalid input detected at '^' marker.
Sw2(config-if)#interface fastEthernet 0/8-24
^
% Invalid input detected at '^' marker.
Sw2(config-if)#interface fastEthernet 0/8-12
^
% Invalid input detected at '^' marker.
Sw2(config-if)#int ra fa 0/9-24
Sw2(config-if-range)#shutdown
%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 FastEthernet0/10, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/12, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/13, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/14, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/15, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/16, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/17, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/18, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/19, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/20, changed state to
administratively down
%LINK-5-CHANGED: Interface FastEthernet0/21, changed state to
administratively down
```

Se verifica que las vlan y puertos queden asignados y activos.



Se realiza configuración de SW2 verificando las Vlan activas.

Sw2
— □ ×

Physical
Config
CLI
Attributes

IOS Command Line Interface

```

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
to down
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
to down

Sw2>show vlan brief

VLAN Name                Status    Ports
-----
1    default                  active    Fa0/1, Fa0/6, Fa0/7, Fa0/8
                                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
100  LAPTOPS                  active    Fa0/2, Fa0/3
200  DESTOPS                  active    Fa0/4, Fa0/5
1002 fddi-default            active
1003 token-ring-default    active
1004 fddinet-default       active
1005 trnet-default         active
Sw2>

```

Ctrl+F6 to exit CLI focus
Copy
Paste

Top

Se configura SW3 con los parámetros de la tabla y se deshabilitan los puertos que no se usaran

Sw3>enable

Sw3#conf

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

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

Sw3(config)#vlan 1

Sw3(config-vlan)#exit

Sw3(config)#int range fa0/1-24

Sw3(config-if-range)#switchport mode access

^

% Invalid input detected at '^' marker.

Sw3(config-if-range)#switchport mode access

Sw3(config-if-range)#switchport access vlan 1

Sw3(config-if-range)#exit

Sw3(config)#int range fa0/7-24

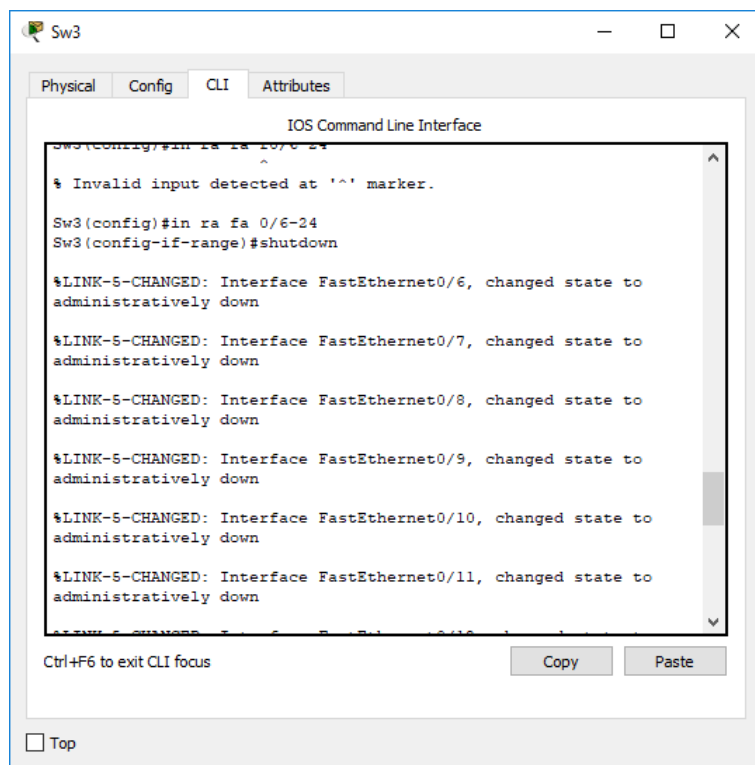
interface range not validated - command rejected

Sw3(config)#int range fa0/7-24

Sw3(config-if-range)#shut

Sw3(config-if-range)#shutdown

Sw3(config-if-range)#



```

Sw3
-----
Physical  Config  CLI  Attributes

IOS Command Line Interface

Sw3(config)#int ra fa 0/6-24
^
% Invalid input detected at '^' marker.

Sw3(config)#in ra fa 0/6-24
Sw3(config-if-range)#shutdown

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

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

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

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

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

%LINK-5-CHANGED: Interface FastEthernet0/11, changed state to
administratively down

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



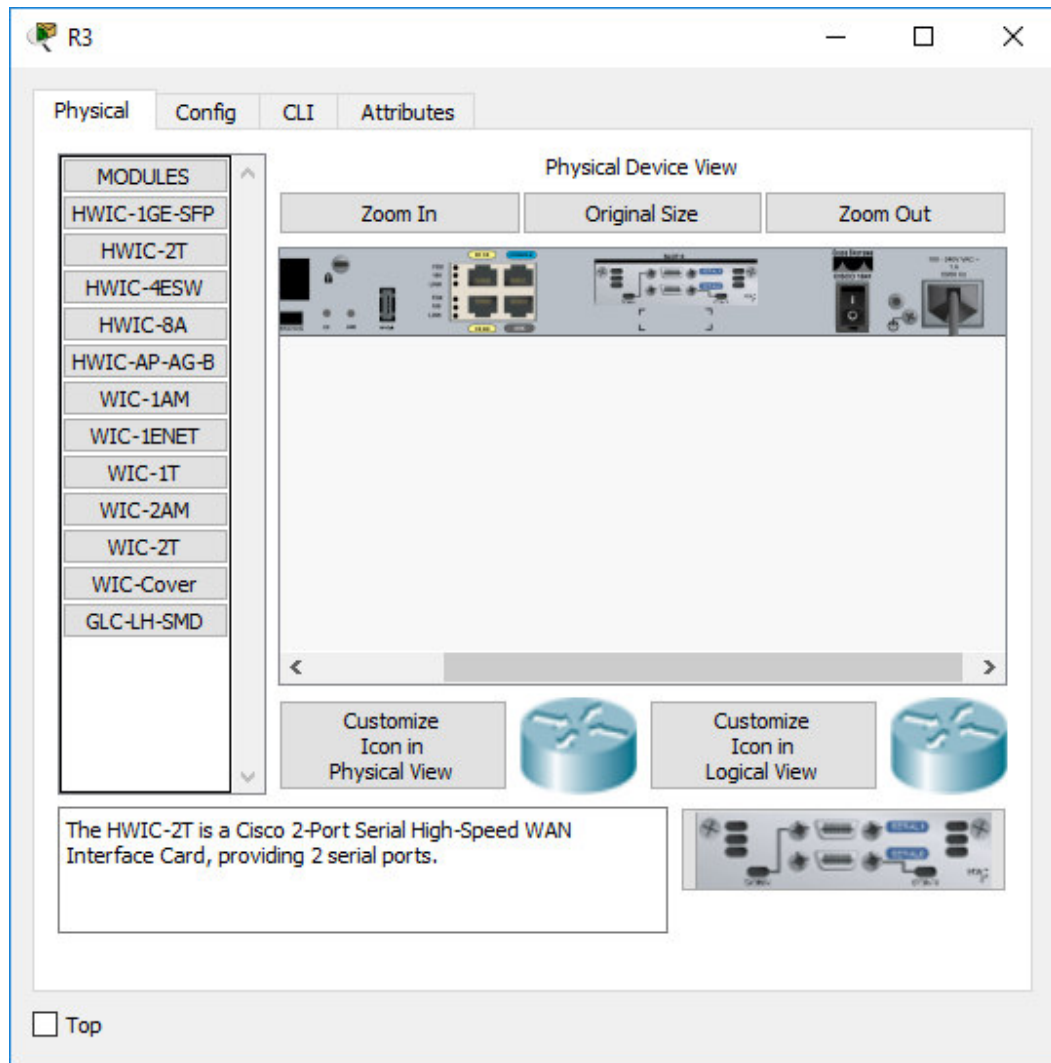
```

Sw3
  Physical  Config  CLI  Attributes
  IOS Command Line Interface
  % Invalid input detected at '^' marker.
  Sw3(config)#sw3
  % Invalid input detected at '^' marker.
  Sw3(config)#vlan 1
  Sw3(config-vlan)#exit
  Sw3(config)#in range f0/2-24
  Sw3(config-if-range)#switchport mode access
  Sw3(config-if-range)#switchport access vlan 1
  Sw3(config-if-range)#exit
  Sw3(config)#exit
  Sw3#
  %SYS-5-CONFIG_I: Configured from console by console
  %LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
  %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1,
  changed state to up
  %LINK-5-CHANGED: Interface FastEthernet0/2, changed state to up
  %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2,
  Ctrl+F6 to exit CLI focus
  Copy  Paste
  Top
  
```

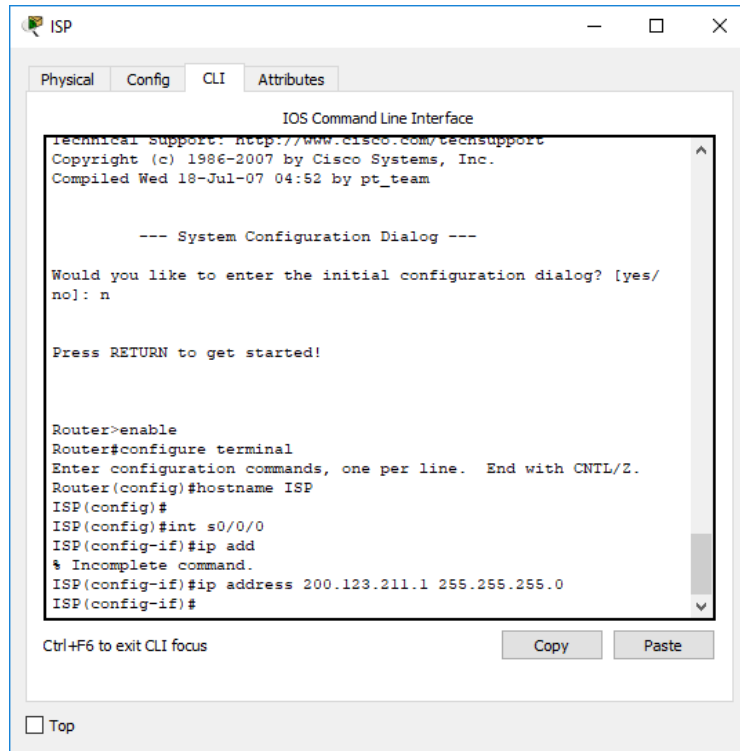
```

Sw3
  Physical  Config  CLI  Attributes
  IOS Command Line Interface
  Sw3>enable
  Sw3#conf
  Configuring from terminal, memory, or network [terminal]?
  Enter configuration commands, one per line. End with CNTL/Z.
  Sw3(config)#vlan 1
  Sw3(config-vlan)#exit
  Sw3(config)#int range fa0/1-24
  Sw3(config-if-range)#swichport mode access
  % Invalid input detected at '^' marker.
  Sw3(config-if-range)#switchport mode access
  Sw3(config-if-range)#switchport access vlan 1
  Sw3(config-if-range)#exit
  Sw3(config)#int range fa0/7.24
  interface range not validated - command rejected
  Sw3(config)#int range fa0/7-24
  Sw3(config-if-range)#shut
  Sw3(config-if-range)#shutdown
  Sw3(config-if-range)#
  Ctrl+F6 to exit CLI focus
  Copy  Paste
  Top
  
```

- **La información** de dirección IP R1, R2 y R3 debe cumplir con la tabla 1. Para poder configurar los puertos seriales se debe instalar la tarjeta



Se configura los puertos con las ip asignadas.



```
ISP
Physical Config CLI Attributes
IOS Command Line Interface
Technical support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 18-Jul-07 04:52 by pt_team

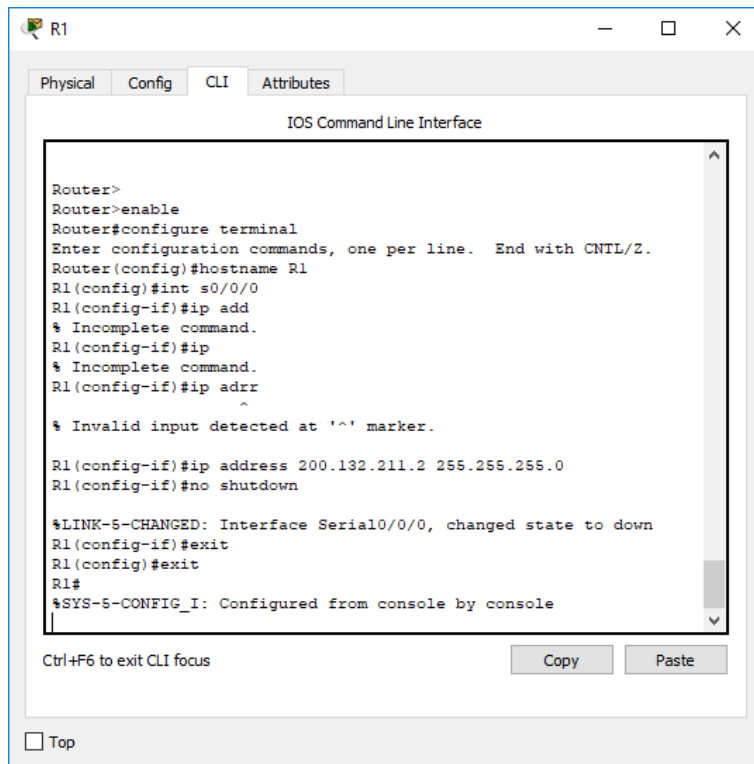
--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname ISP
ISP(config)#
ISP(config)#int s0/0/0
ISP(config-if)#ip add
% Incomplete command.
ISP(config-if)#ip address 200.123.211.1 255.255.255.0
ISP(config-if)#

Ctrl+F6 to exit CLI focus
```



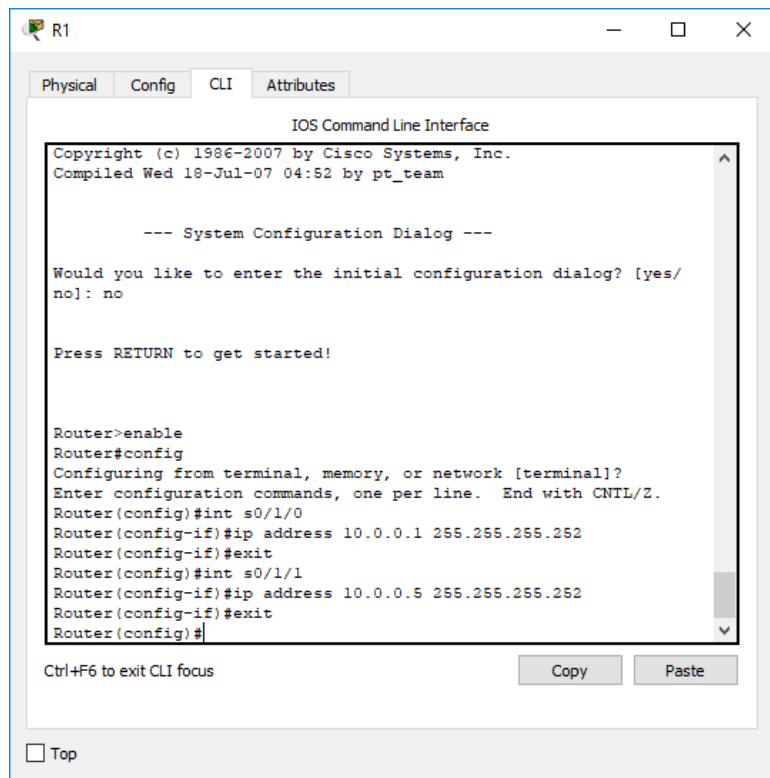
```
R1
Physical Config CLI Attributes
IOS Command Line Interface

Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1
R1(config)#int s0/0/0
R1(config-if)#ip add
% Incomplete command.
R1(config-if)#ip
% Incomplete command.
R1(config-if)#ip addr
^
% Invalid input detected at '^' marker.

R1(config-if)#ip address 200.132.211.2 255.255.255.0
R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#exit
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

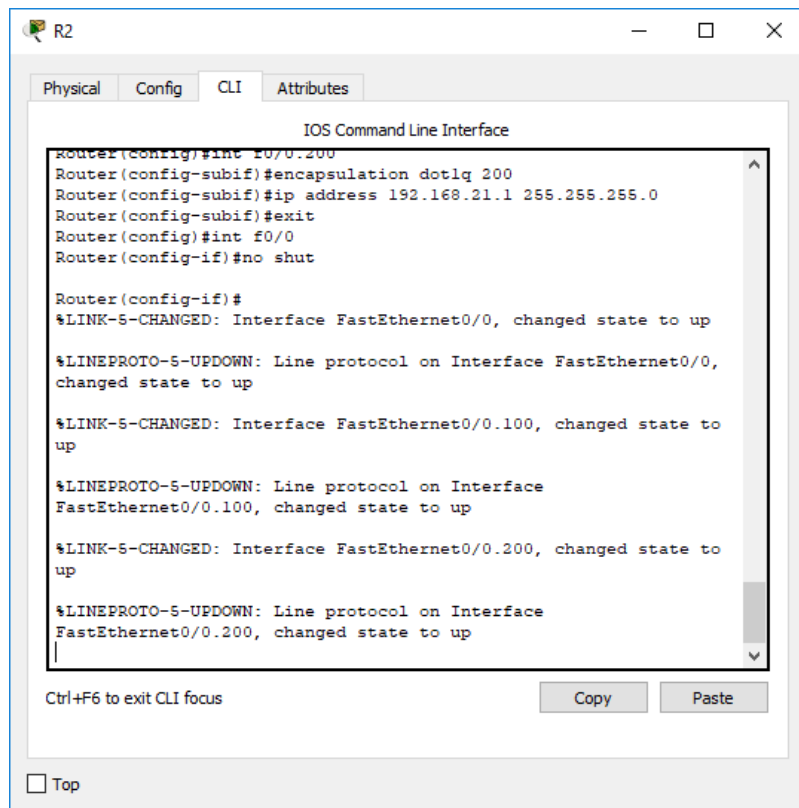
Ctrl+F6 to exit CLI focus
```



The screenshot shows the CLI window for router R1. The window title is 'R1' and it has tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, showing the 'IOS Command Line Interface'. The text in the terminal window is as follows:

```
Copyright (c) 1986-2007 by Cisco Systems, Inc.  
Compiled Wed 18-Jul-07 04:52 by pt_team  
  
--- System Configuration Dialog ---  
  
Would you like to enter the initial configuration dialog? [yes/  
no]: no  
  
Press RETURN to get started!  
  
Router>enable  
Router#config  
Configuring from terminal, memory, or network [terminal]?  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#int s0/1/0  
Router(config-if)#ip address 10.0.0.1 255.255.255.252  
Router(config-if)#exit  
Router(config)#int s0/1/1  
Router(config-if)#ip address 10.0.0.5 255.255.255.252  
Router(config-if)#exit  
Router(config)#
```

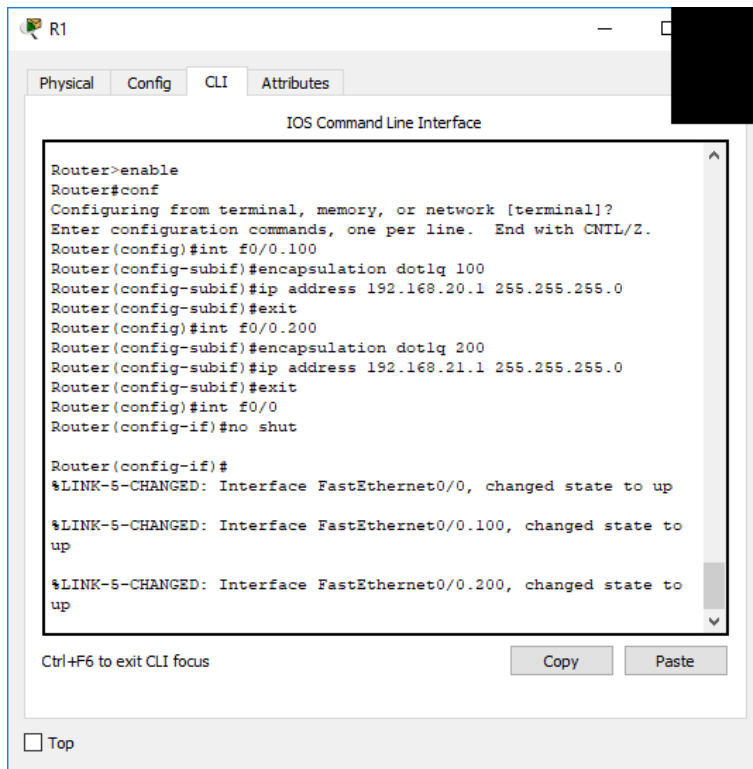
At the bottom of the terminal window, there is a 'Ctrl+F6 to exit CLI focus' message and 'Copy' and 'Paste' buttons. A 'Top' button is located below the terminal window.



The screenshot shows the CLI window for router R2. The window title is 'R2' and it has tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, showing the 'IOS Command Line Interface'. The text in the terminal window is as follows:

```
Router(config)#int 10/0.200  
Router(config-subif)#encapsulation dot1q 200  
Router(config-subif)#ip address 192.168.21.1 255.255.255.0  
Router(config-subif)#exit  
Router(config)#int f0/0  
Router(config-if)#no shut  
  
Router(config-if)#  
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,  
changed state to up  
  
%LINK-5-CHANGED: Interface FastEthernet0/0.100, changed state to  
up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface  
FastEthernet0/0.100, changed state to up  
  
%LINK-5-CHANGED: Interface FastEthernet0/0.200, changed state to  
up  
%LINEPROTO-5-UPDOWN: Line protocol on Interface  
FastEthernet0/0.200, changed state to up
```

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 located below the terminal window.

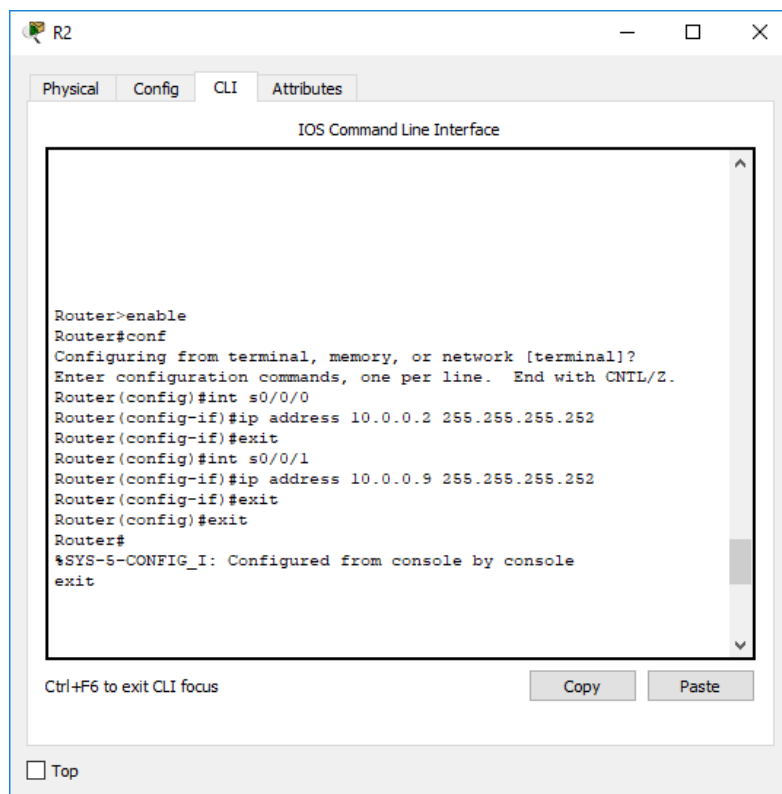


The screenshot shows the CLI window for router R1. The window title is 'R1' and it has tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, showing the 'IOS Command Line Interface'. The terminal output is as follows:

```
Router>enable
Router#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0.100
Router(config-subif)#encapsulation dot1q 100
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/0.200
Router(config-subif)#encapsulation dot1q 200
Router(config-subif)#ip address 192.168.21.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/0.100, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/0.200, changed state to up
```

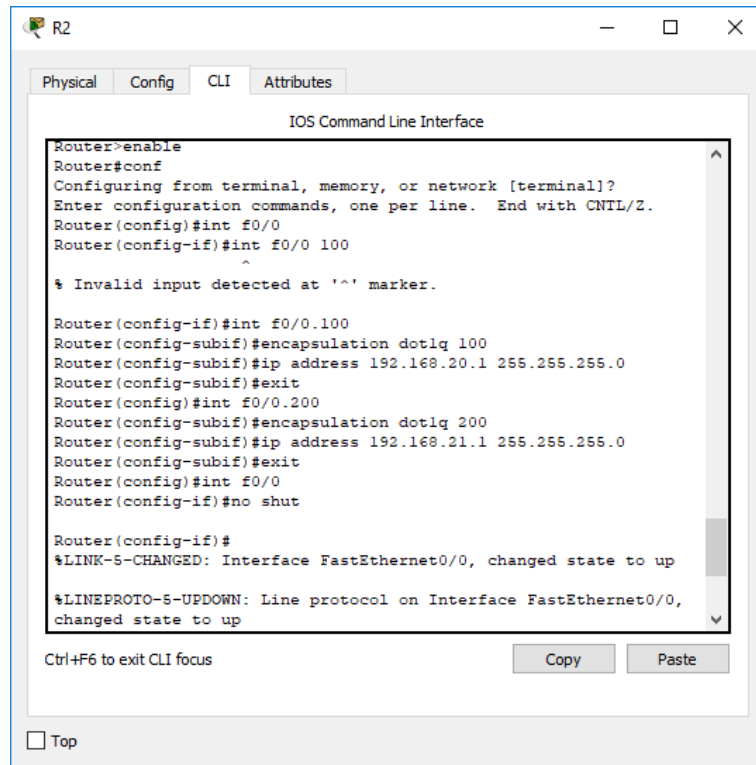
At the bottom of the terminal area, there is a prompt 'Ctrl+F6 to exit CLI focus' and two buttons: 'Copy' and 'Paste'. Below the terminal area is a 'Top' button.



The screenshot shows the CLI window for router R2. The window title is 'R2' and it has tabs for 'Physical', 'Config', 'CLI', and 'Attributes'. The 'CLI' tab is active, showing the 'IOS Command Line Interface'. The terminal output is as follows:

```
Router>enable
Router#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int s0/0/0
Router(config-if)#ip address 10.0.0.2 255.255.255.252
Router(config-if)#exit
Router(config)#int s0/0/1
Router(config-if)#ip address 10.0.0.9 255.255.255.252
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

At the bottom of the terminal area, there is a prompt 'Ctrl+F6 to exit CLI focus' and two buttons: 'Copy' and 'Paste'. Below the terminal area is a 'Top' button.



R2

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>enable
Router#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#int f0/0 100
^
% Invalid input detected at '^' marker.

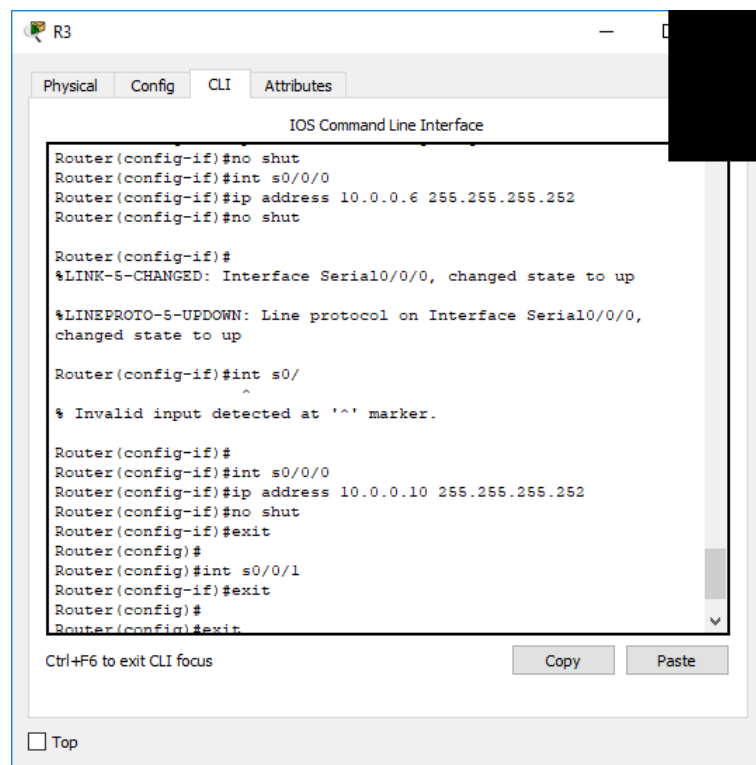
Router(config-if)#int f0/0.100
Router(config-subif)#encapsulation dot1q 100
Router(config-subif)#ip address 192.168.20.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/0.200
Router(config-subif)#encapsulation dot1q 200
Router(config-subif)#ip address 192.168.21.1 255.255.255.0
Router(config-subif)#exit
Router(config)#int f0/0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0,
changed state to up
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



R3

Physical Config CLI Attributes

IOS Command Line Interface

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

Router(config-if)#
%LINK-5-CHANGED: Interface Serial10/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial10/0/0,
changed state to up

Router(config-if)#int s0/
^
% Invalid input detected at '^' marker.

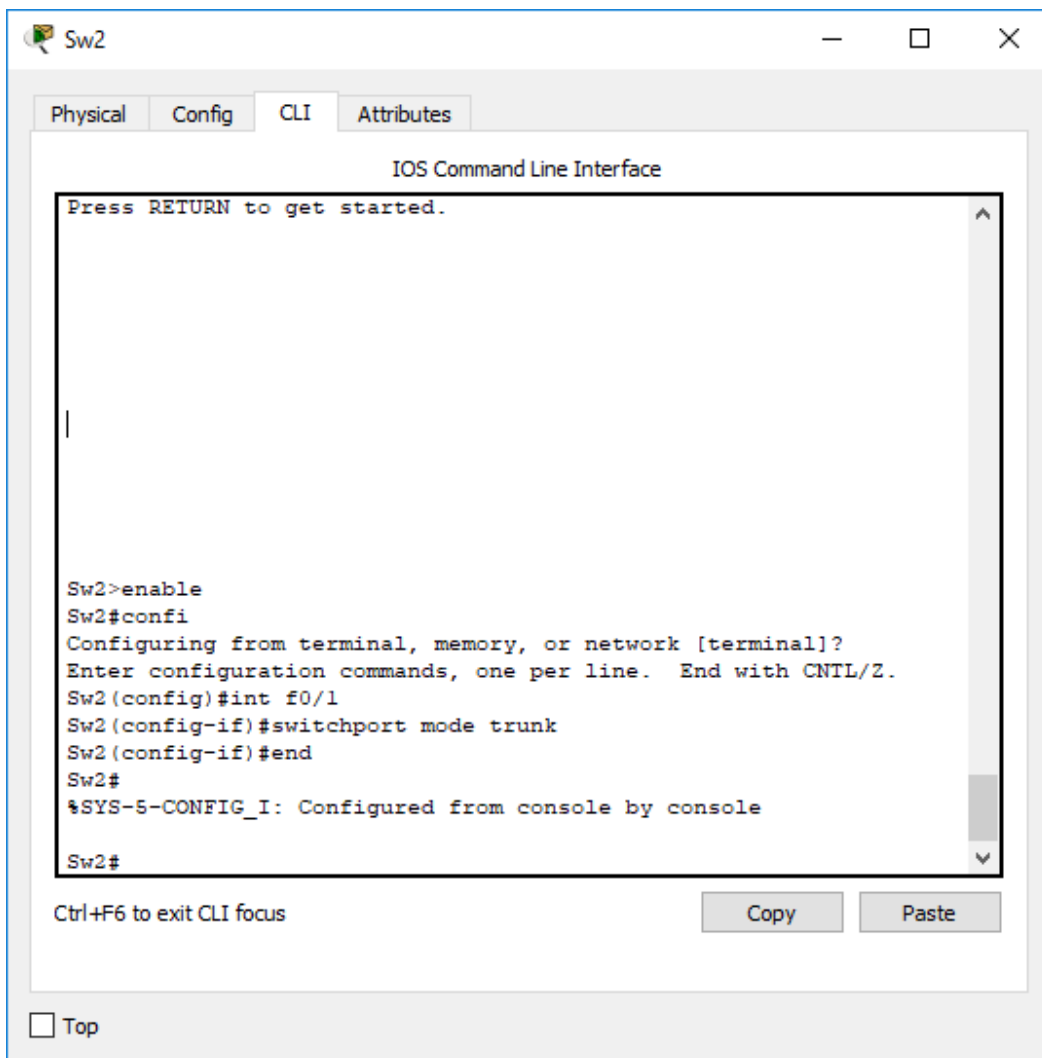
Router(config-if)#
Router(config-if)#int s0/0/0
Router(config-if)#ip address 10.0.0.10 255.255.255.252
Router(config-if)#no shut
Router(config-if)#exit
Router(config)#
Router(config)#int s0/0/1
Router(config-if)#exit
Router(config)#
Router(config)#exit
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

```
Se realiza la creación de los enlaces troncales en los SW
Sw2>enable
Sw2#confi
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Sw2(config)#int f0/1
Sw2(config-if)#switchport mode trunk
Sw2(config-if)#end
Sw2#
%SYS-5-CONFIG_I: Configured from console by console
```



The screenshot shows a window titled "Sw2" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The interface shows the following text:

```
Press RETURN to get started.

Sw2>enable
Sw2#confi
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Sw2(config)#int f0/1
Sw2(config-if)#switchport mode trunk
Sw2(config-if)#end
Sw2#
%SYS-5-CONFIG_I: Configured from console by console

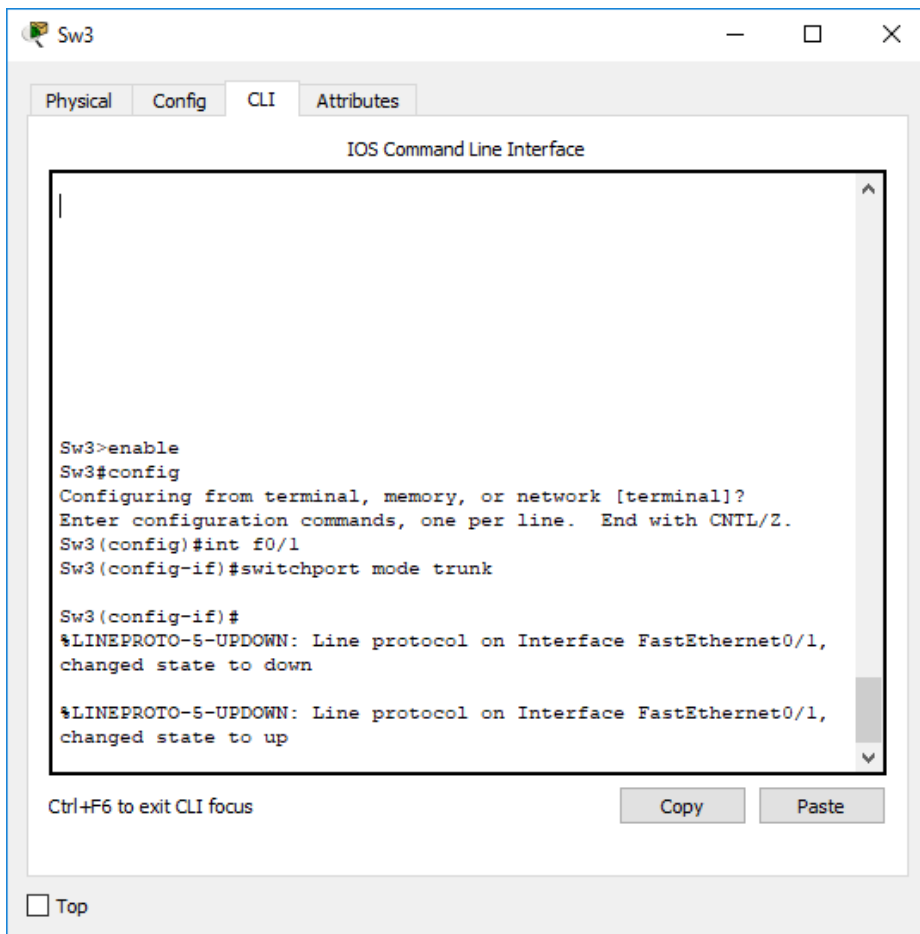
Sw2#
```

At the bottom of the CLI 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.

```
Sw3>enable
Sw3#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Sw3(config)#int f0/1
Sw3(config-if)#switchport mode trunk
```

```
Sw3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to down
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up
```



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

The image shows two screenshots of network configuration windows. The top window is for 'Laptop31' and the bottom window is for 'PC0'. Both windows have tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Config' tab is active, showing 'IP Configuration' and 'IPv6 Configuration' sections.

Laptop31 Configuration:

- IP Configuration:** DHCP is selected. IP Address: 169.254.59.7, Subnet Mask: 255.255.0.0, Default Gateway: 0.0.0.0, DNS Server: 0.0.0.0.
- IPv6 Configuration:** Static is selected. IPv6 Address: [empty], Link Local Address: FE80::2D0:BCFF:FED2:3B07, IPv6 Gateway: [empty], IPv6 DNS Server: [empty].

PC0 Configuration:

- IP Configuration:** DHCP is selected. IP Address: 169.254.40.189, Subnet Mask: 255.255.0.0, Default Gateway: 0.0.0.0, DNS Server: 0.0.0.0.
- IPv6 Configuration:** Static is selected. IPv6 Address: [empty], Link Local Address: FE80::240:8FF:FE5C:28BD, IPv6 Gateway: [empty], IPv6 DNS Server: [empty].

PC31

Physical Config Desktop Programming Attributes

IP Configuration X

IP Configuration

DHCP Static

IP Address: 169.254.188.238

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address: /

Link Local Address: FE80::240:BFF:FE4B:BCEE

IPv6 Gateway:

IPv6 DNS Server:

Top

PC1

Physical Config Desktop Programming Attributes

IP Configuration X

IP Configuration

DHCP Static

IP Address: 169.254.19.202

Subnet Mask: 255.255.0.0

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

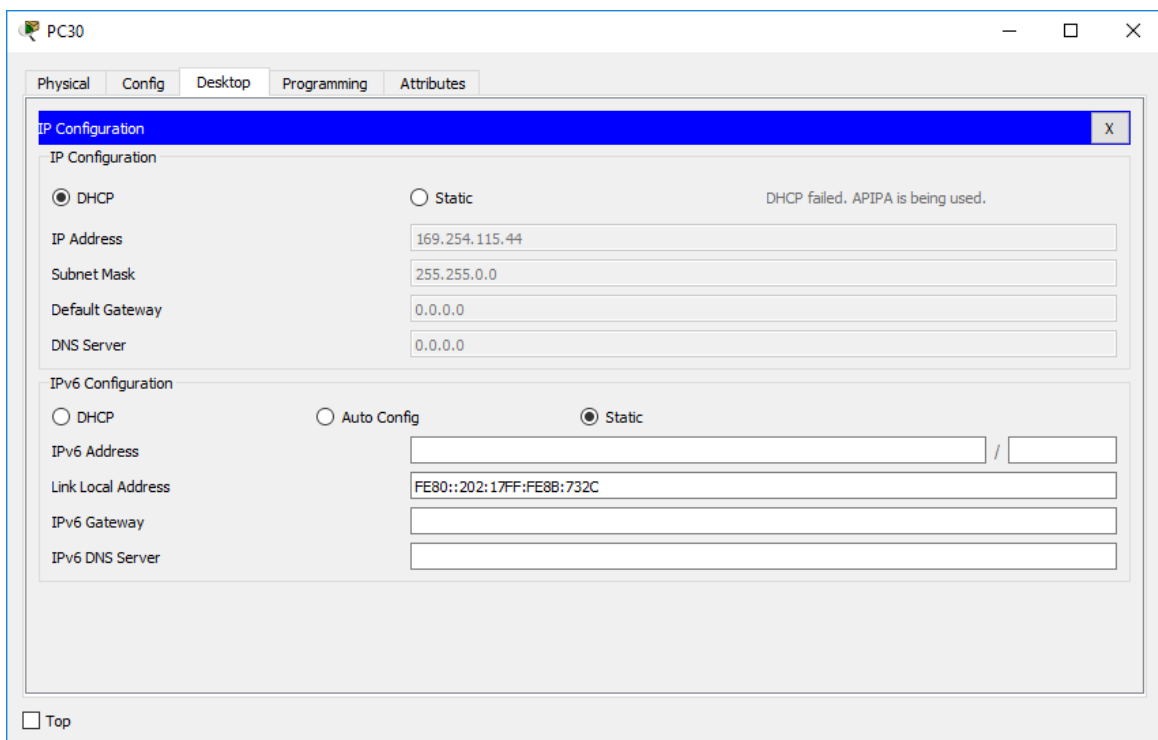
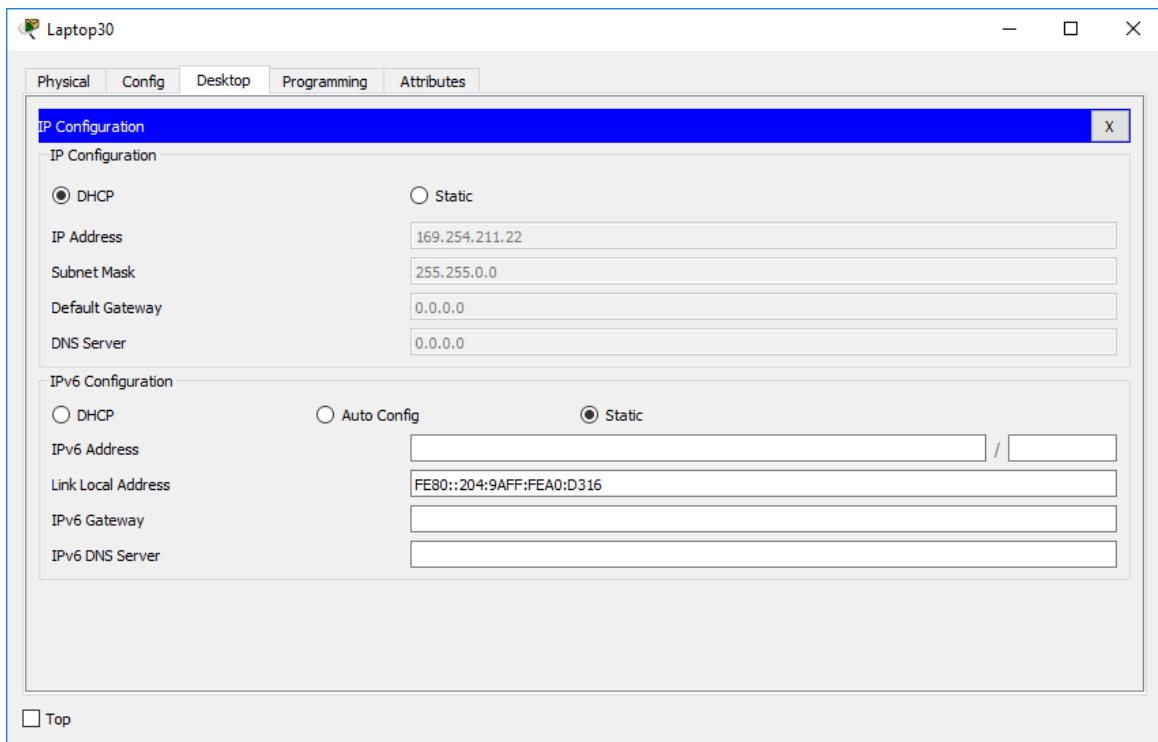
IPv6 Address: /

Link Local Address: FE80::2E0:F9FF:FE0B:13CA

IPv6 Gateway:

IPv6 DNS Server:

Top



- **R1** debe realizar una NAT con sobrecarga sobre una dirección IPv4 pública.



Asegúrese de que todos los terminales pueden comunicarse con Internet pública (haga ping a la dirección ISP) y la lista de acceso estándar se **llama INSIDE-DEVS**.



```

state to up

Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#access-list 1 permit 192.168.0.0 0.0.255.255
Router(config)#access-list 1 permit 10.0.0.0 0.0.0.255
Router(config)#ip nat pool INSIDE-DEVS 200.123.211.2
% Incomplete command.
Router(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
netmask 255.255.255.0
Router(config)#ip nat inside source list 1 interface s0/0/0
Router(config)#ip nat inside source list 1 interface s0/0/0 overload
Router(config)#int s0/1/1
Router(config-if)#ip nat inside
Router(config-if)#int s0/1/0
Router(config-if)#ip nat inside
Router(config-if)#int s0/0/0
Router(config-if)#ip nat outside
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#version 2
Router(config-router)#network 1.00
^
% Invalid input detected at '^' marker.

Router(config-router)#network 1.0.0.0
Router(config-router)#network 10.0.0.0
Router(config-router)#default-information originate
Router(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

Se procede a configura la NAT en el R1 con sobrecarga en una dirección IPv4 publica.

```

R1>enable
R1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
  
```

```
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#netmask 255.255.255.0
^
% Invalid input detected at '^' marker.
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128 netmask
255.255.255.0
R1(config)#access-list 1 permit 192
^
% Invalid input detected at '^' marker.
R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255
^
% Invalid input detected at '^' marker.
R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255
R1(config)#access-list 1 permit 10.0.0.0 0.0.0.255
R1(config)#ip nat inside source list 1 int s0/0/0 overload
R1(config)#int s0/1/0
R1(config-if)#ip nat inside
R1(config-if)#int s0/1/1
R1(config-if)#ip nat inside
R1(config-if)#int s0/0/0
R1(config-if)#ip nat inside
R1(config-if)#ip nat outside
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

```

R1#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#netmask 255.255.255.0
^
% Invalid input detected at '^' marker.

R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
% Incomplete command.
R1(config)#ip nat pool INSIDE-DEVS 200.123.211.2 200.123.211.128
netmask 255.255.255.0
R1(config)#access-list 1 permit 192
^
% Invalid input detected at '^' marker.

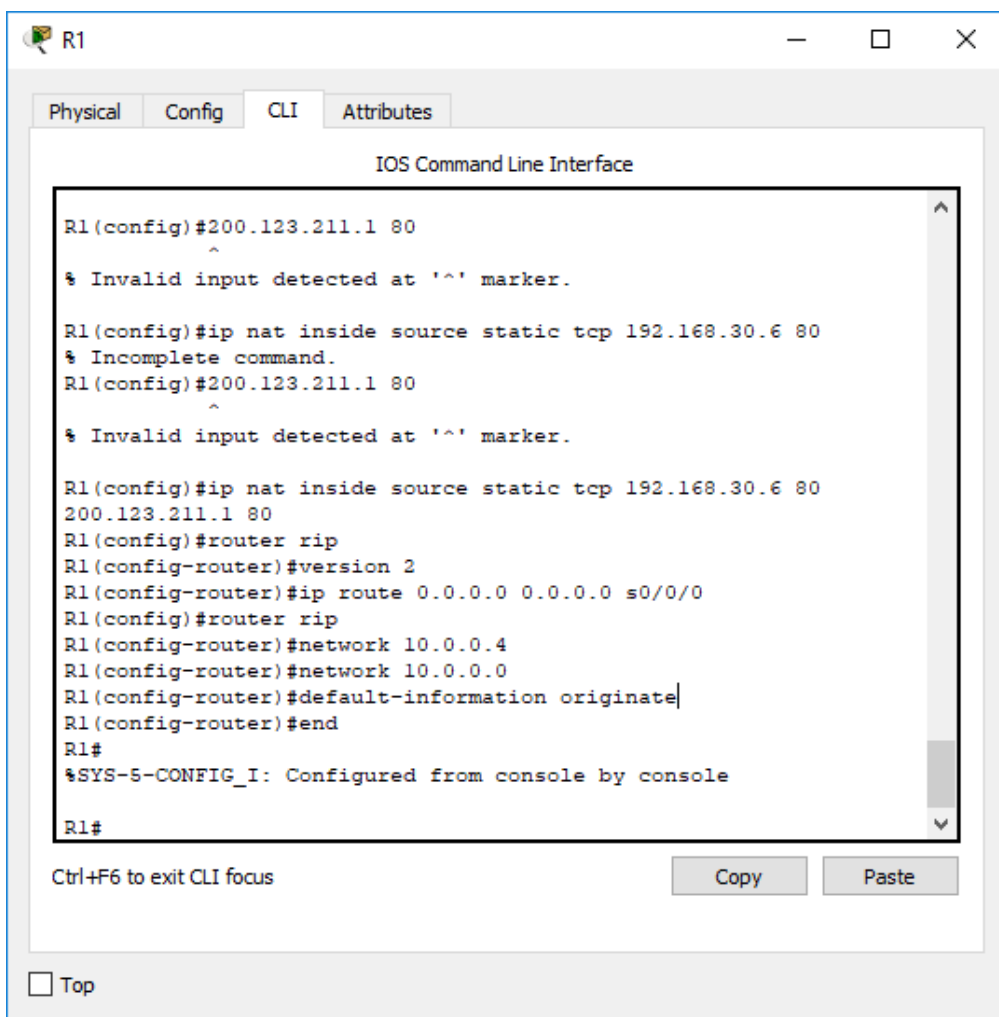
R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255
^
% Invalid input detected at '^' marker.

R1(config)#access-list 1 permit 192.168.0.0 0.0.255.255
R1(config)#access-list 1 permit 10.0.0.0 0.0.0.255
R1(config)#ip nat inside source list 1 int s0/0/0 overload
R1(config)#int s0/1/0
R1(config-if)#ip nat inside
R1(config-if)#int s0/1/1
R1(config-if)#ip nat inside
R1(config-if)#int s0/0/0
R1(config-if)#ip nat inside
R1(config-if)#ip nat outside
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
  
```

- **R1** debe tener una ruta estática predeterminada al ISP que se configuró y que incluye esa ruta en **el dominio** RIPv2.
Invalid input detected at '^' marker.

```

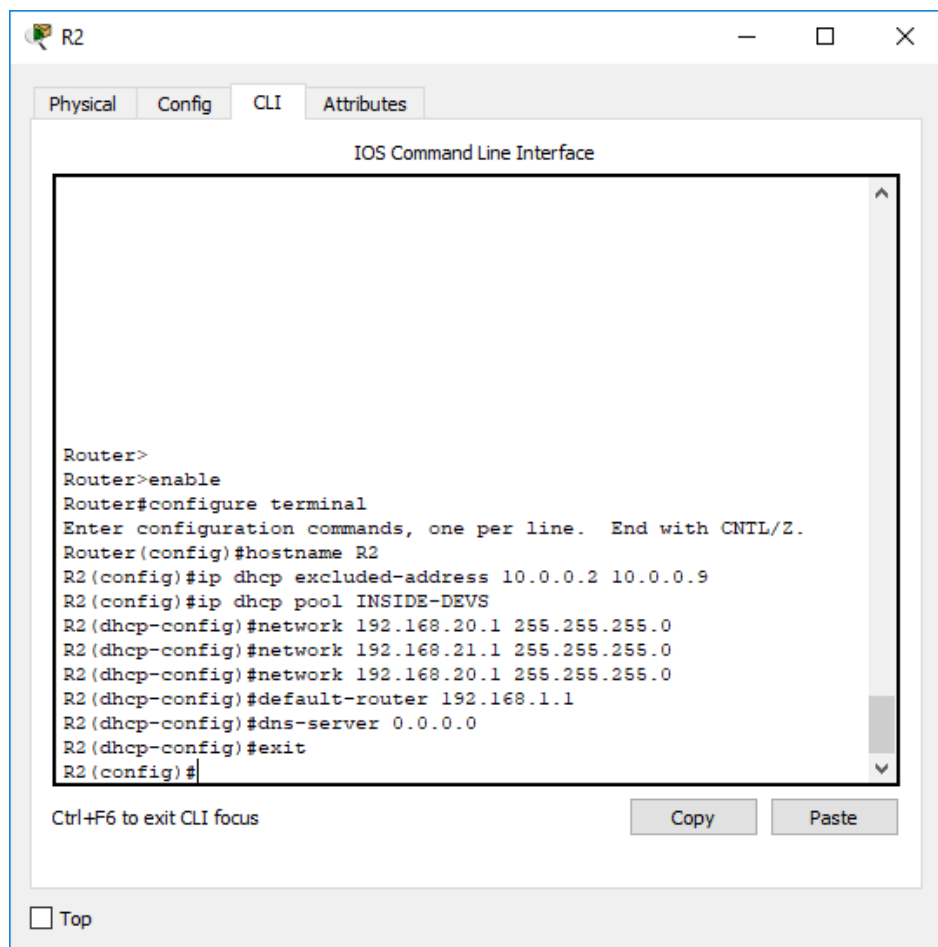
R1(config)#ip nat inside source static tcp 192.168.30.6 80
% Incomplete command.
R1(config)#200.123.211.1 80
^
% Invalid input detected at '^' marker.
R1(config)#ip nat inside source static tcp 192.168.30.6 80 200.123.211.1 80
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#ip route 0.0.0.0 0.0.0.0 s0/0/0
R1(config)#router rip
R1(config-router)#network 10.0.0.4
R1(config-router)#network 10.0.0.0
R1(config-router)#default-information originate
R1(config-router)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
  
```



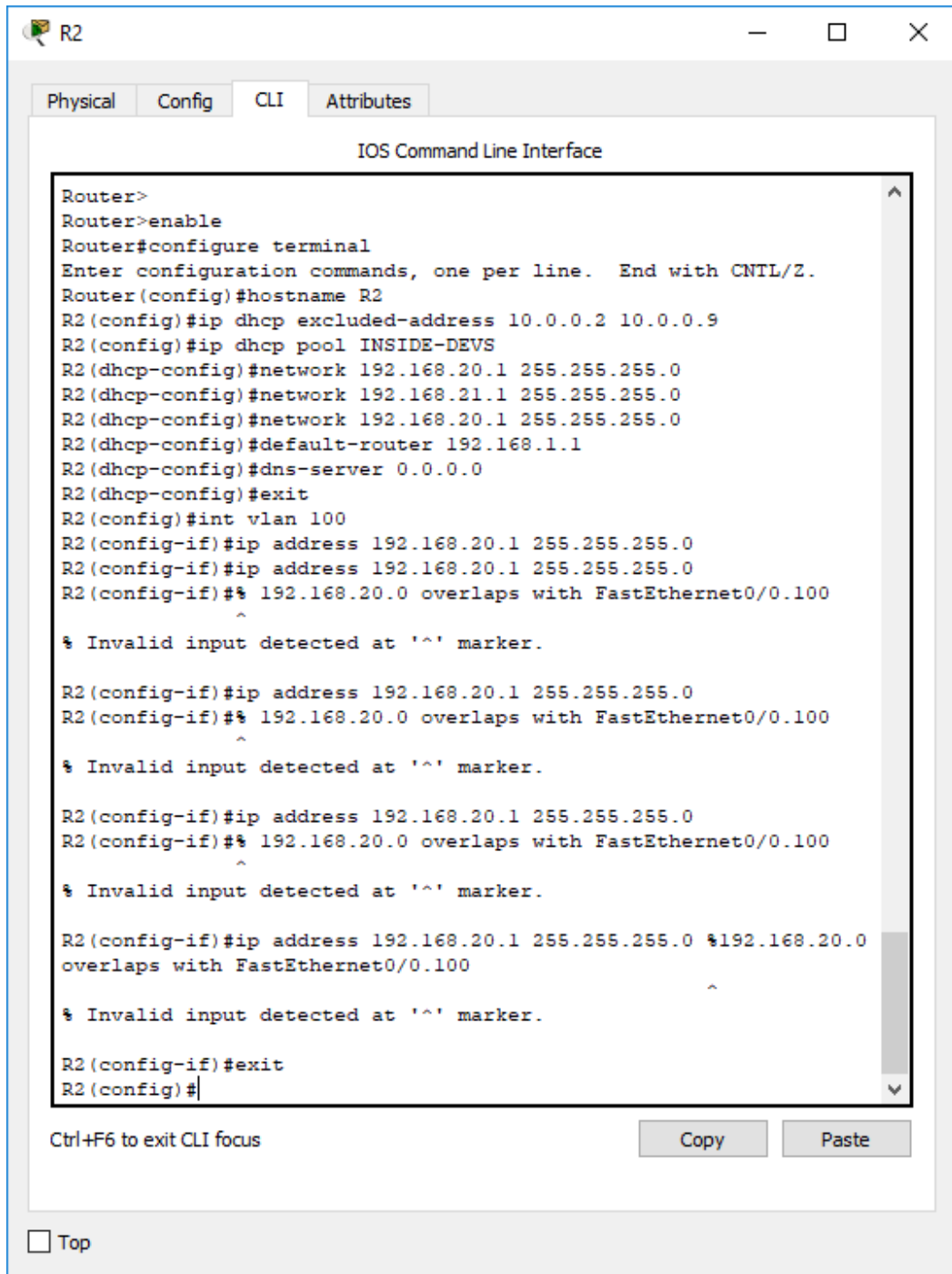
- **R2** es un servidor de DHCP para los dispositivos conectados al puerto FastEthernet0/0.

```

R2>enable
R2#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9
R2(config)#ip dhcp pool INSIDE-DEVS
R2(dhcp-config)#network 192.168.20.1 255.255.255.0
R2(dhcp-config)#network 192.168.21.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.1.1
^
% Invalid input detected at '^' marker.
R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 0.0.0.0
R2(dhcp-config)#exit
  
```



- **R2** debe, además de enrutamiento a otras partes de la red, ruta entre las VLAN 100 y 200.



The screenshot shows a terminal window titled "R2" with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and responses:

```

Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2
R2(config)#ip dhcp excluded-address 10.0.0.2 10.0.0.9
R2(config)#ip dhcp pool INSIDE-DEVS
R2(dhcp-config)#network 192.168.20.1 255.255.255.0
R2(dhcp-config)#network 192.168.21.1 255.255.255.0
R2(dhcp-config)#network 192.168.20.1 255.255.255.0
R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 0.0.0.0
R2(dhcp-config)#exit
R2(config)#int vlan 100
R2(config-if)#ip address 192.168.20.1 255.255.255.0
R2(config-if)#ip address 192.168.20.1 255.255.255.0
R2(config-if)#% 192.168.20.0 overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.

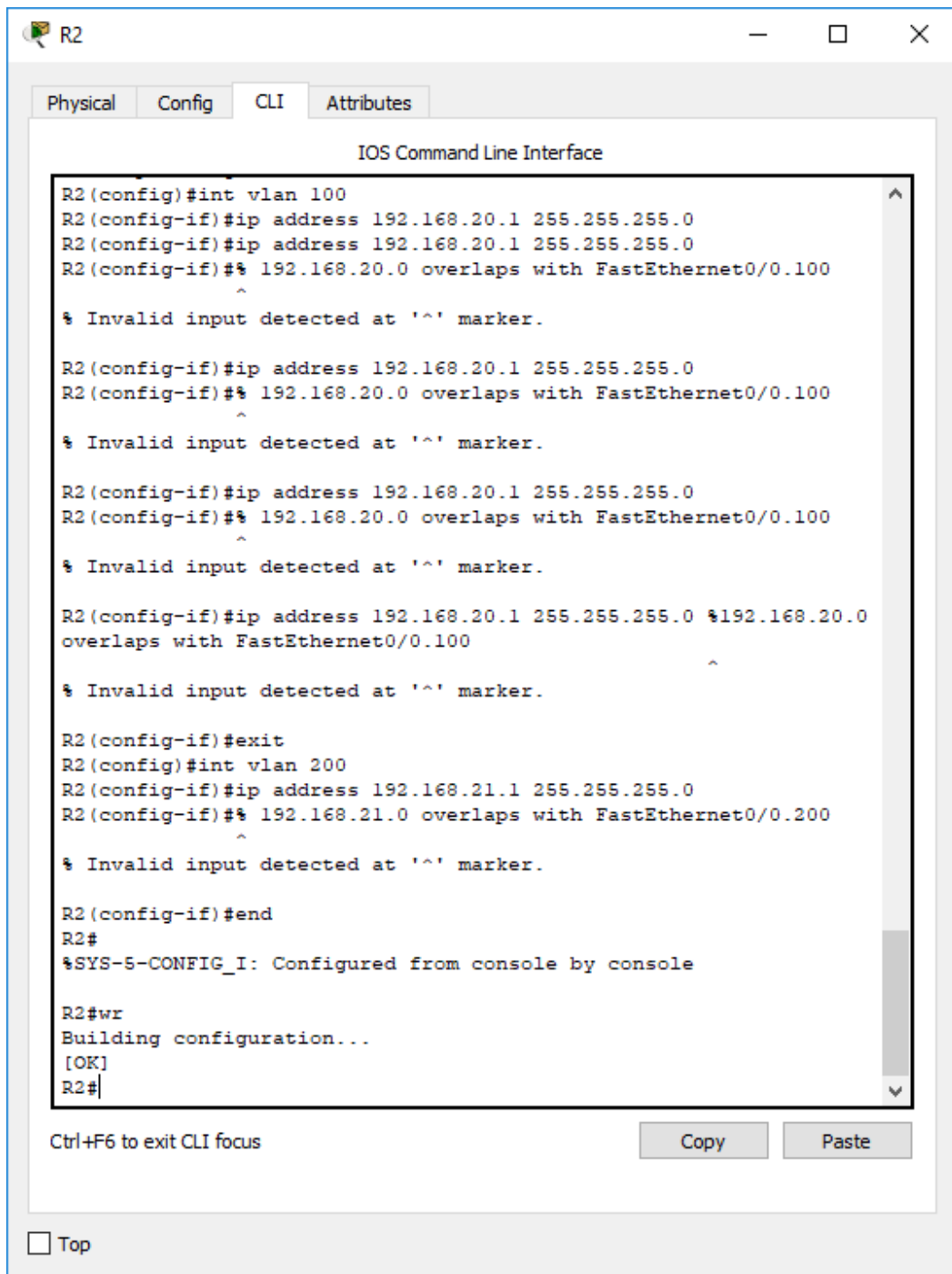
R2(config-if)#ip address 192.168.20.1 255.255.255.0
R2(config-if)#% 192.168.20.0 overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.

R2(config-if)#ip address 192.168.20.1 255.255.255.0
R2(config-if)#% 192.168.20.0 overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.

R2(config-if)#ip address 192.168.20.1 255.255.255.0 %192.168.20.0
overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.

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

At the bottom of the terminal window, there is a prompt "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". Below the terminal window, there is a checkbox labeled "Top".



```
R2
R2 (config)#int vlan 100
R2 (config-if)#ip address 192.168.20.1 255.255.255.0
R2 (config-if)#ip address 192.168.20.1 255.255.255.0
R2 (config-if)#% 192.168.20.0 overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.
R2 (config-if)#ip address 192.168.20.1 255.255.255.0
R2 (config-if)#% 192.168.20.0 overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.
R2 (config-if)#ip address 192.168.20.1 255.255.255.0
R2 (config-if)#% 192.168.20.0 overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.
R2 (config-if)#ip address 192.168.20.1 255.255.255.0 %192.168.20.0
overlaps with FastEthernet0/0.100
^
% Invalid input detected at '^' marker.
R2 (config-if)#exit
R2 (config)#int vlan 200
R2 (config-if)#ip address 192.168.21.1 255.255.255.0
R2 (config-if)#% 192.168.21.0 overlaps with FastEthernet0/0.200
^
% Invalid input detected at '^' marker.
R2 (config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
[OK]
R2#
```

Ctrl+F6 to exit CLI focus

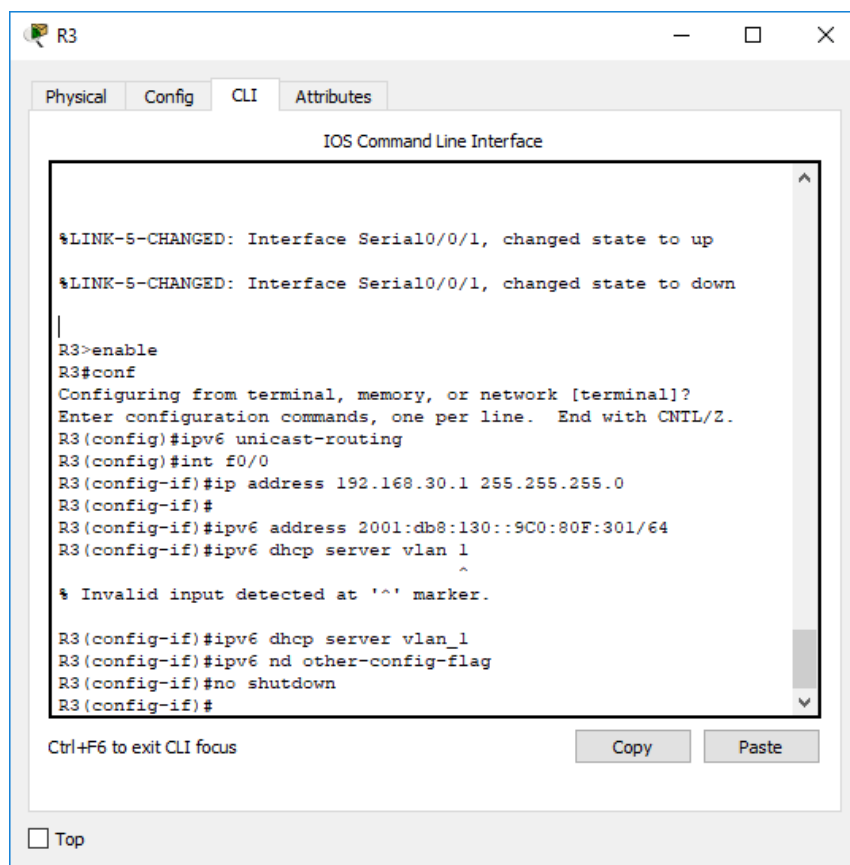
Copy Paste

Top

- El Servidor0 es sólo un servidor IPv6 y solo debe ser accesibles para los dispositivos en R3 (ping).

```

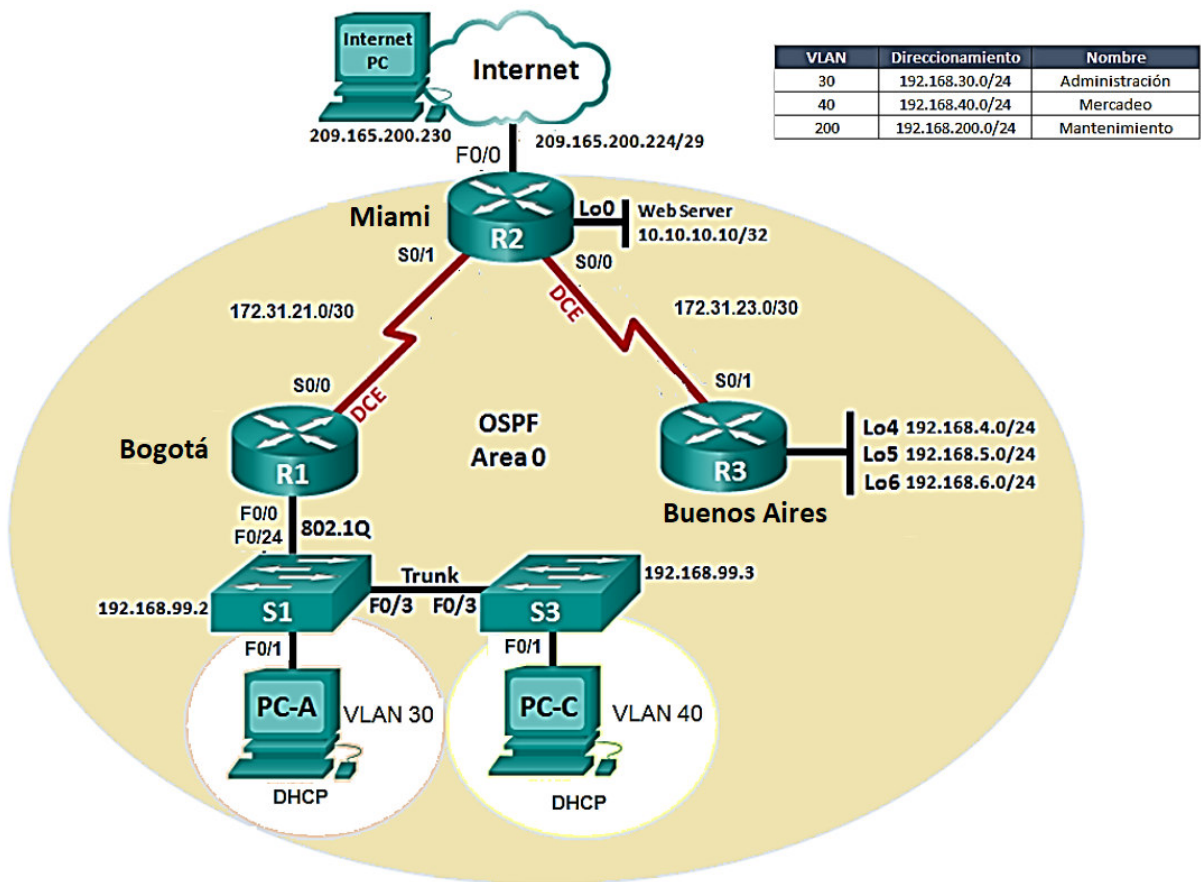
R3>enable
R3#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ipv6 unicast-routing
R3(config)#int f0/0
R3(config-if)#ip address 192.168.30.1 255.255.255.0
R3(config-if)#
R3(config-if)#ipv6 address 2001:db8:130::9C0:80F:301/64
R3(config-if)#ipv6 dhcp server vlan 1
^
% Invalid input detected at '^' marker.
R3(config-if)#ipv6 dhcp server vlan_1
R3(config-if)#ipv6 nd other-config-flag
R3(config-if)#no shutdown
R3(config-if)#
  
```



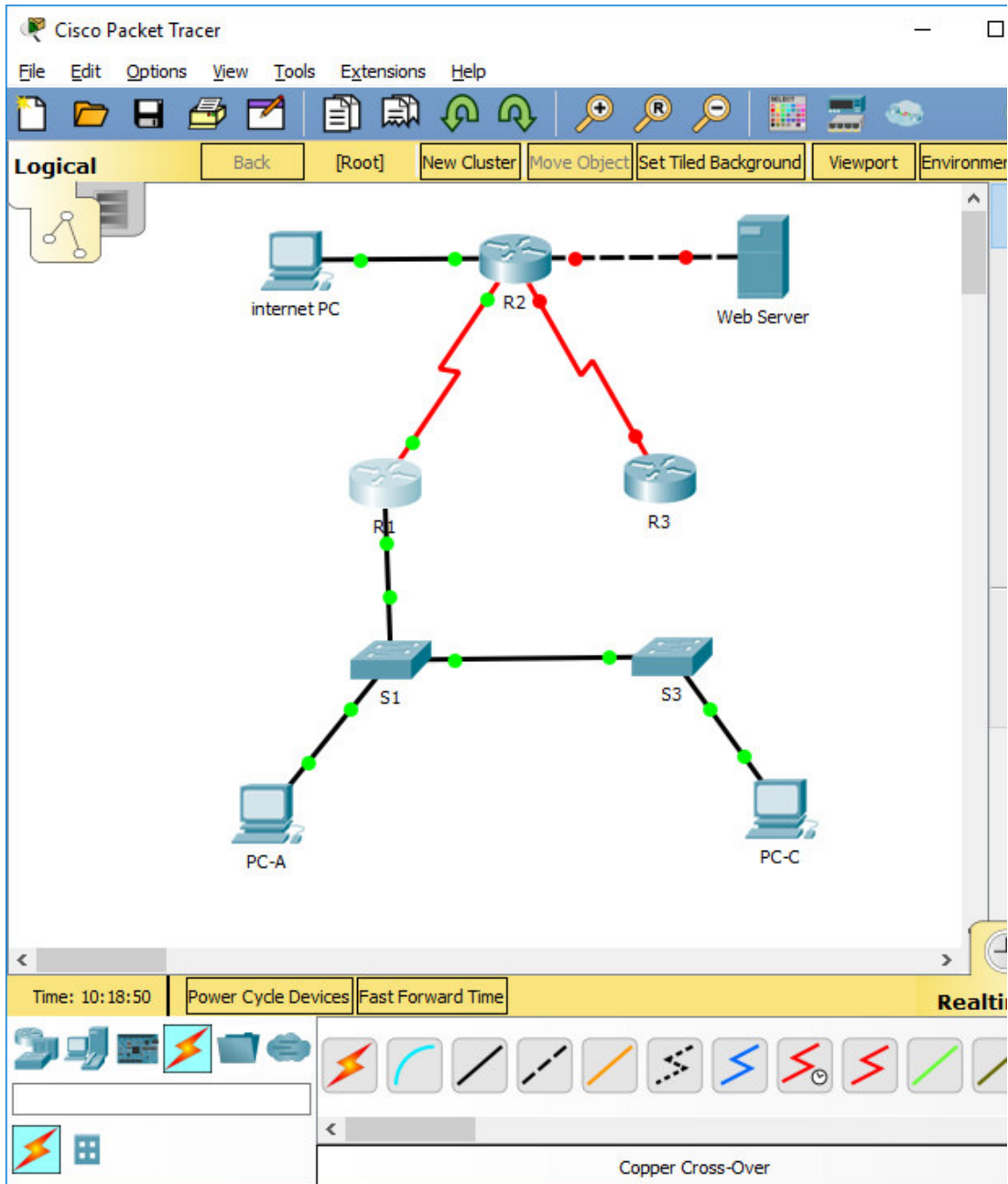
- La NIC instalado en direcciones IPv4 e IPv6 de Laptop30, de Laptop31, de PC30 y obligación de configurados PC31 simultáneas (dual-stack). Las direcciones se deben configurar mediante DHCP y DHCPv6.
- La interfaz FastEthernet 0/0 del R3 también deben tener direcciones IPv4 e IPv6 configuradas (dual- stack).
- R1, R2 y R3 intercambian información de routing mediante RIP versión 2.
- R1, R2 y R3 deben saber sobre las rutas de cada uno y la ruta predeterminada desde R1.
- Verifique la conectividad. Todos los terminales deben poder hacer ping entre sí y a la dirección IP del ISP. Los terminales bajo **el R3** deberían poder hacer IPv6-ping entre ellos y el servidor.

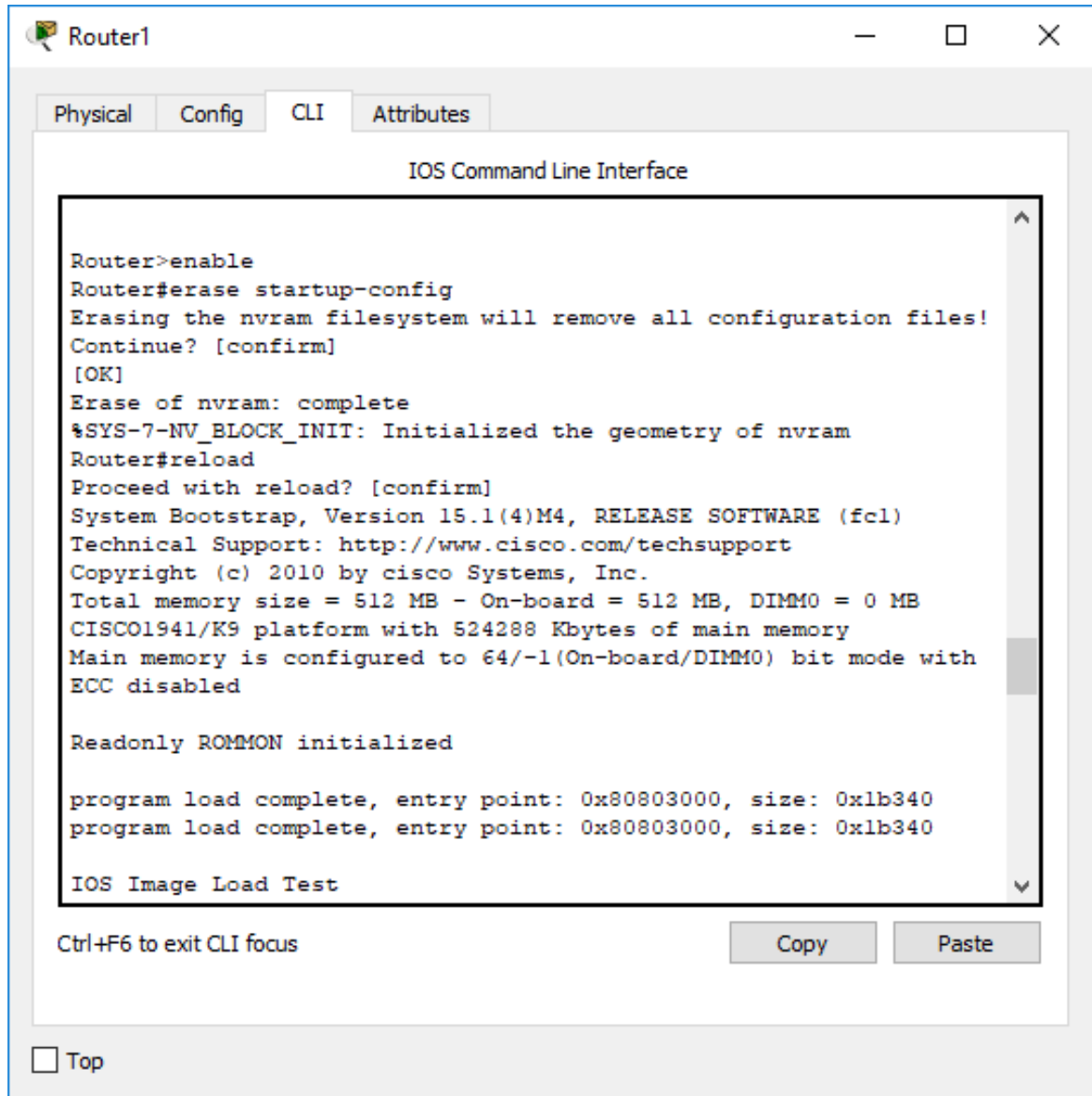
Escenario 2

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



1. Configurar el direccionamiento IP acorde con la topología de red para cada uno de los dispositivos que forman parte del escenario. Procedemos a configurar los dispositivos router, switches, y PC iniciando con el reset de los routers.





The screenshot shows a window titled "Router1" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following sequence of commands and responses:

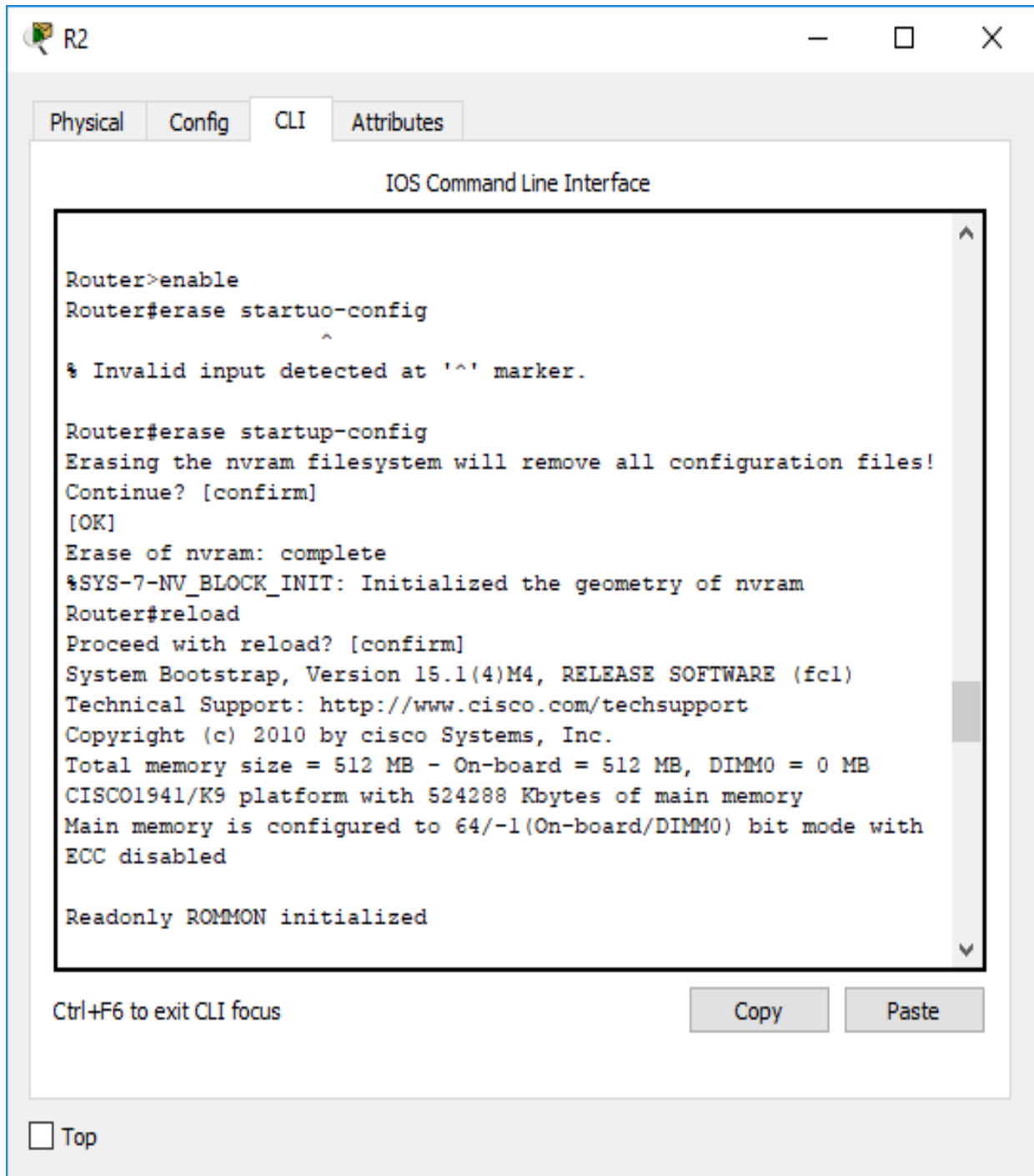
```
Router>enable
Router#erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 15.1(4)M4, RELEASE 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/K9 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
```

At the bottom of the CLI window, there is a prompt "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". Below the CLI window, there is a checkbox labeled "Top".



R2

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>enable
Router#erase startuo-config
      ^
% Invalid input detected at '^' marker.

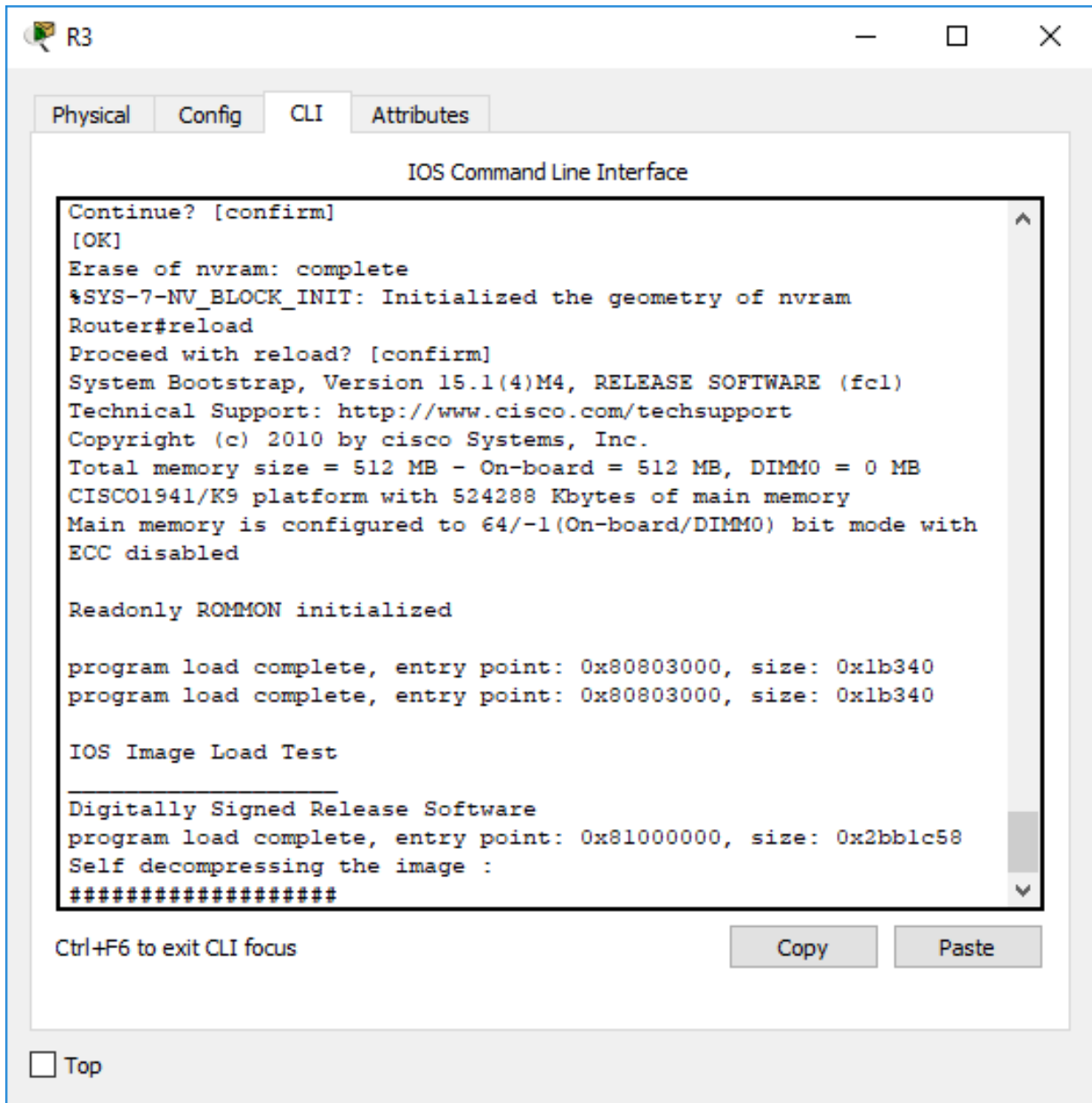
Router#erase startup-config
Erasing the nvram filesystem will remove all configuration files!
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#reload
Proceed with reload? [confirm]
System Bootstrap, Version 15.1(4)M4, RELEASE SOFTWARE (fcl)
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/K9 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
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



The screenshot shows a 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 following sequence of events:

```
Continue? [confirm]
[OK]
Erase of nvram: complete
%SYS-7-NV_BLOCK_INIT: Initialized the geometry of nvram
Router#reload
Proceed with reload? [confirm]
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/K9 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 :
*****
```

Below the terminal output, there is a text label "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste". At the bottom left of the window, there is a checkbox labeled "Top".



Iniciamos la configuración R1 según parámetros indicados y sus ip's.

```
Router>enable
```

```
Router#conf t
```

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

```
Router(config)#hostname R1
```

```
R1(config)#int s0/0/0
```

```
R1(config-if)#ip address 172.31.21.1 255.255.255.252
```

```
R1(config-if)#no shutdown
```

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

```
R1(config-if)#conf t
```

```
%Invalid hex value
```

```
R1(config)#int g0/0
```

```
R1(config-if)#ip address 192.168.99.1 255.255.255.0
```

```
R1(config-if)#no shutdown
```

```
R1(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
```

```
R1(config-if)#exit
```

```
R1(config)#
```

```
Router>enable
```

```
Router#enable
```

```
Router#conf t
```

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

```
Router(config)#hostname R2
```

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

```
Router(config)#int 0/0/1
```

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

```
Router(config)#int s0/0/1
```

```
Router(config-if)#ip address 172.31.21.2 255.255.255.252
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
```

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

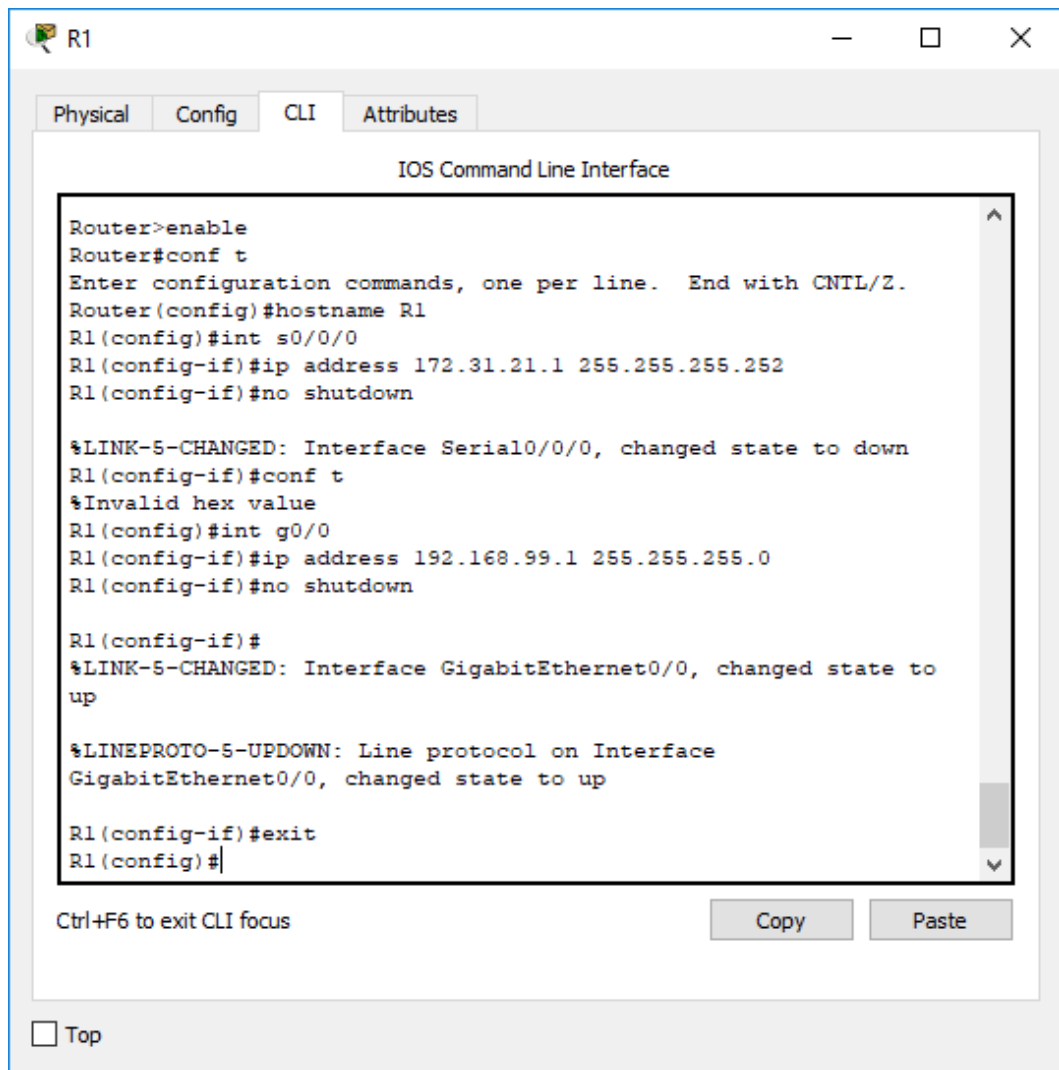
```
Router#
```

Iniciamos la configuración de parámetros según lo indicado en la guía en el R1.

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

```
Router#enable
```

```
Router#conf t
```



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

Continuamos con la configuración del Router 2

```
Router(config)#hostname R2
```

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

```
R2(config-if)#ip address 172.31.21.2 255.255.255.252
```

```
R2(config-if)#no shutdown
```

```
R2(config-if)#int g0/0
```



```
R2(config-if)#ip address 209.165.200.255 255.255.255.248
Bad mask /29 for address 209.165.200.255
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#
%SYS-5-CONFIG_I: Configured from console by console
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface loopback 0
R2(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to
up
R2(config-if)#ip address 10.10.10.10 255.255.255.255
R2(config-if)#
R2#
%SYS-5-CONFIG_I: Configured from console by console
```

```

R2
Physical Config CLI Attributes
IOS Command Line Interface
Bad mask /29 for address 209.165.200.255
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#
%SYS-5-CONFIG_I: Configured from console by console

R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface loopback 0

R2(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0,
changed state to up

R2(config-if)#ip address 10.10.10.10 255.255.255.255
R2(config-if)#
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top

```

R3
Physical Config CLI Attributes
IOS Command Line Interface
%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)#interface loopback 5

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)#interface loopback 6

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 address 192.168.6.1 255.255.255.0
R3(config-if)#exit
R3(config)#
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



Seguimos con la configuración de ip's del Router 3

```
Router>enable
```

```
Router#conf t
```

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

```
Router(config)#hostname R3
```

```
R3(config)#int s0/0/1
```

```
R3(config-if)#ip address 172.31.23.1 255.255.255.252
```

```
R3(config-if)#no shutdown
```

```
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
```

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

```
R3(config-if)#interface loopback 4
```

```
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)#interface loopback 5
```

```
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)#interface loopback 6
```

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

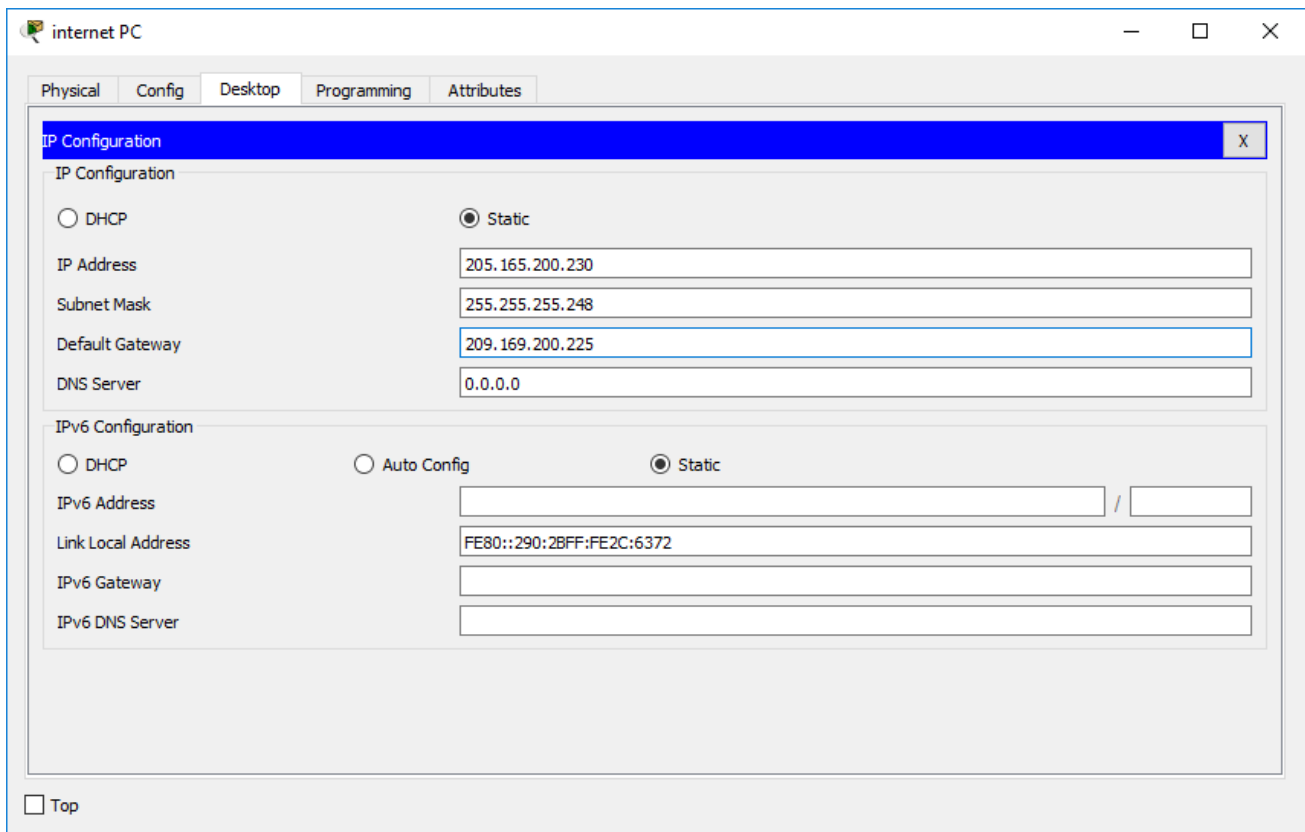
```
%LINK-5-CHANGED: Interface Loopback6, changed state to up
```


%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback6, changed state to up

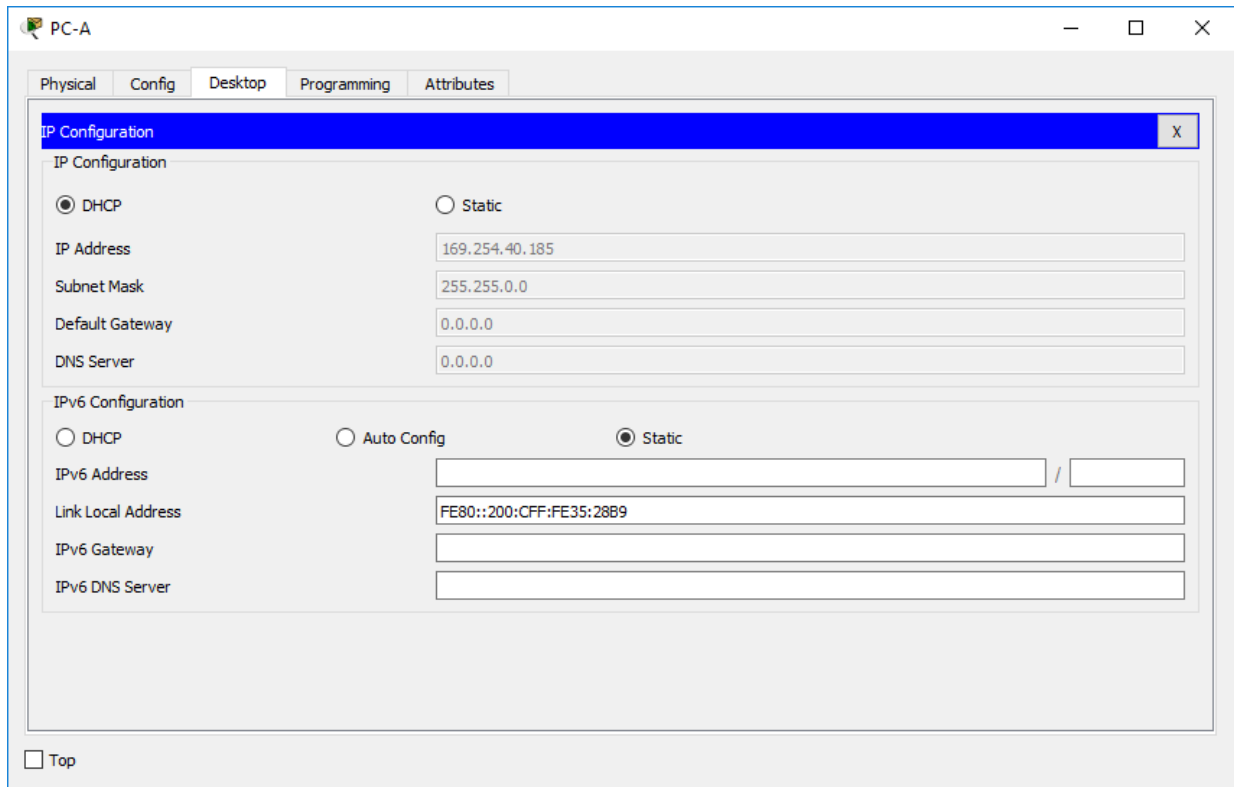
R3(config-if)#ip address 192.168.6.1 255.255.255.0

R3(config-if)#exit

R3(config)#



Configuramos el Pc A



The screenshot shows the configuration window for PC-A, titled "PC-A". It has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Config" tab is active, and the "IP Configuration" section is highlighted in blue. Below this, there are two main configuration sections: "IP Configuration" and "IPv6 Configuration".

IP Configuration:

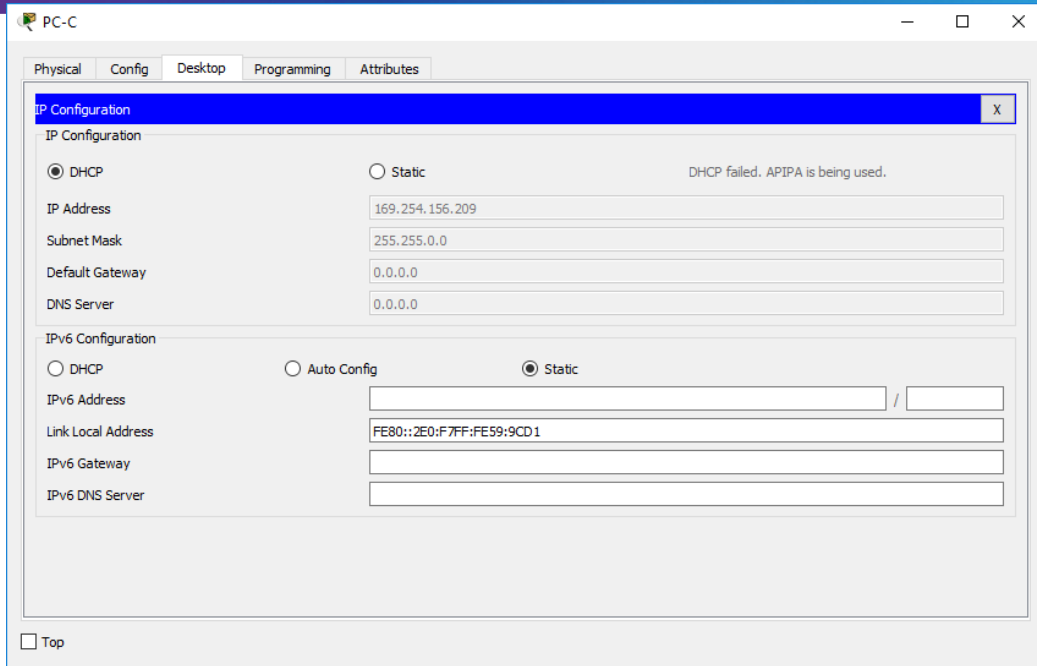
- DHCP
- Static
- IP Address: 169.254.40.185
- Subnet Mask: 255.255.0.0
- Default Gateway: 0.0.0.0
- DNS Server: 0.0.0.0

IPv6 Configuration:

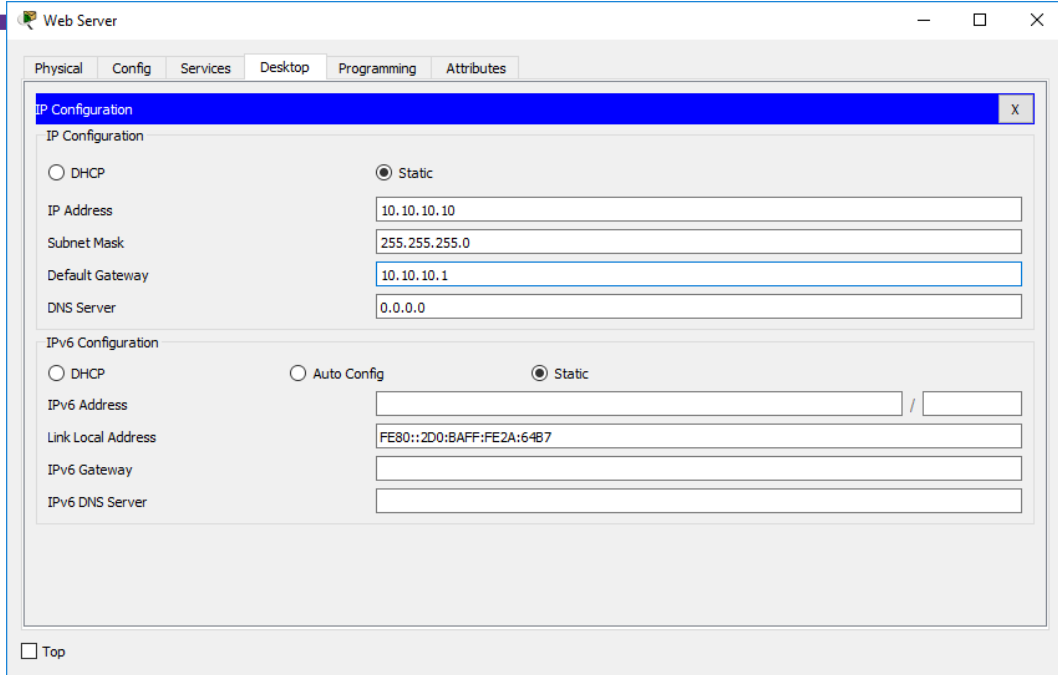
- DHCP
- Auto Config
- Static
- IPv6 Address: [Empty field] / [Empty field]
- Link Local Address: FE80::200:CFF:FE35:28B9
- IPv6 Gateway: [Empty field]
- IPv6 DNS Server: [Empty field]

At the bottom left of the window, there is a "Top" button with a checkbox.

Continuamos con la configuración del Pc C



Configuración de web server



The screenshot shows a 'Web Server' configuration window with the following settings:

Section	Option	Value
IP Configuration	Static	<input checked="" type="radio"/>
	DHCP	<input type="radio"/>
	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	Static	<input checked="" type="radio"/>
	Auto Config	<input type="radio"/>
	DHCP	<input type="radio"/>
	IPv6 Address	
	Link Local Address	FE80::2D0:BAFF:FE2A:64B7
IPv6 Gateway		
IPv6 DNS Server		

Top

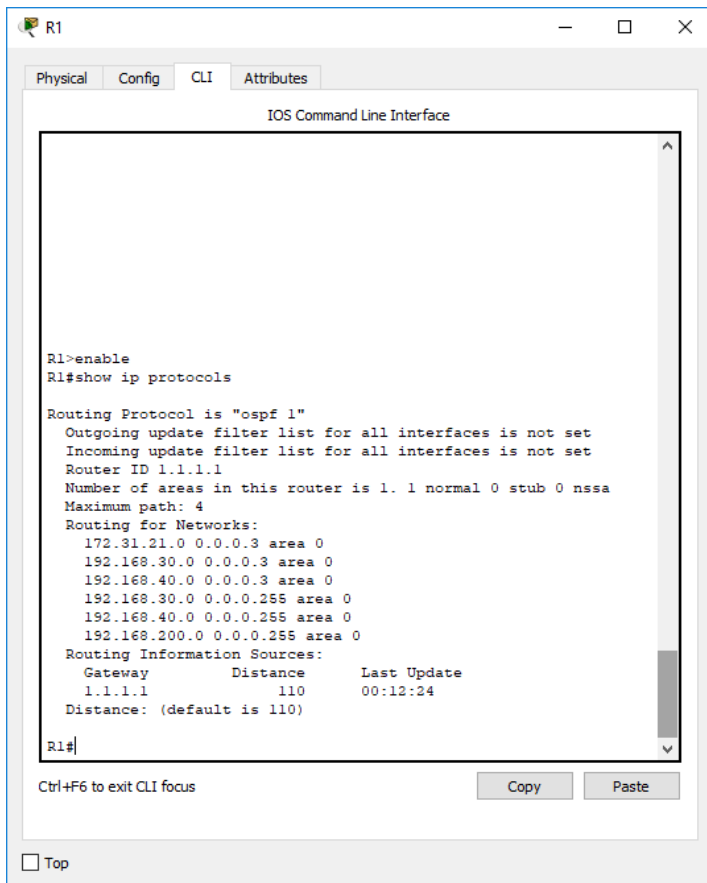
2. Configurar el protocolo de enrutamiento OSPFv2 bajo los siguientes criterios:

OSPFv2 area 0

Configuration Item or Task	Specification
Router ID R1	1.1.1.1
Router ID R2	5.5.5.5
Router ID R3	8.8.8.8
Configurar todas las interfaces LAN como pasivas	
Establecer el ancho de banda para enlaces seriales en	256 Kb/s
Ajustar el costo en la métrica de S0/0 a	9500

Verificar información de OSPF

- Visualizar tablas de enrutamiento y routers conectados por OSPFv2
- Visualizar lista resumida de interfaces por OSPF en donde se ilustre el costo de cada interface
- Visualizar el OSPF Process ID, Router ID, Address summarizations, Routing Networks, and passive interfaces configuradas en cada router.





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

R2
— □ ×

Physical
Config
CLI
Attributes

IOS Command Line Interface

```

172.31.23.0 0.0.0.3 area 0
10.10.10.0 0.0.0.255 area 0
Routing Information Sources:
  Gateway      Distance    Last Update
  5.5.5.5      110        00:20:26
Distance: (default is 110)

R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#
R2(config)#router ospf
% Incomplete command.
R2(config)#router ospf 1
R2(config-router)#network 172.31.21.0 0.0.0.3 area 0
R2(config-router)#
R2(config-router)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 5.5.5.5
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
    10.10.10.0 0.0.0.255 area 0
    172.31.21.0 0.0.0.3 area 0
  Routing Information Sources:
    Gateway      Distance    Last Update
    5.5.5.5      110        00:00:51
  Distance: (default is 110)

R2#
          
```

Ctrl+F6 to exit CLI focus

Copy
Paste

Top

Configuramos ip's de los routers según requerimientos



The screenshot shows a terminal window for router R3 with the following content:

```

R3
Physical Config CLI Attributes
IOS Command Line Interface
% Invalid input detected at '^' marker.
R3(config-router)#network 172.31.23.0 0.0.0.3 area 0
R3(config-router)#network 192.168.4.0 0.0.3.255 area 0
R3(config-router)#passive-interface lo4
^
% 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)#exit
R3(config)#int s0/0/1
R3(config-if)#bandwidth 256
R3(config-if)#exit
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console

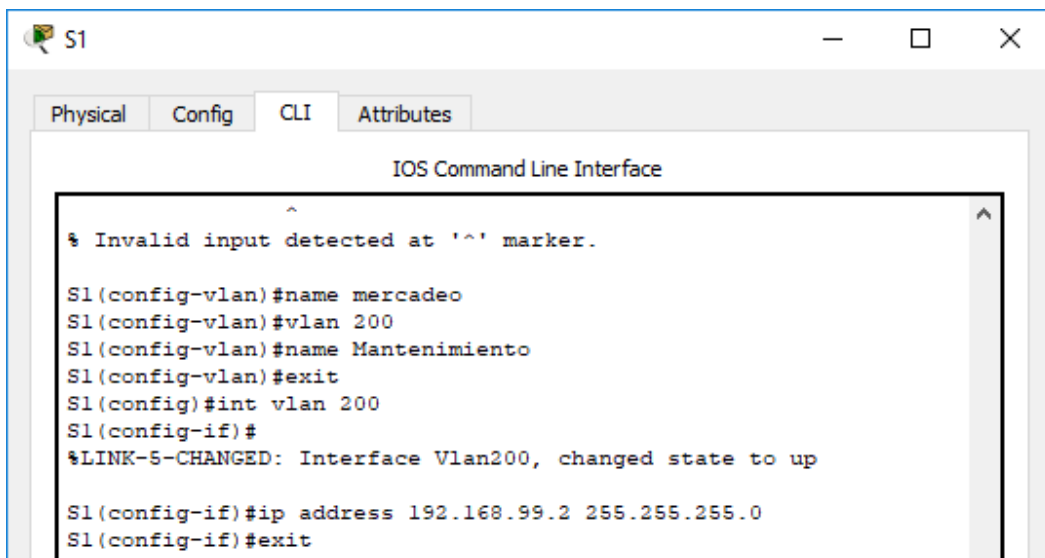
R3#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 8.8.8.8
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    172.31.23.0 0.0.0.3 area 0
    192.168.4.0 0.0.3.255 area 0
  Passive Interface(s):
    Loopback4
    Loopback5
    Loopback6
  Routing Information Sources:
    Gateway         Distance      Last Update
    8.8.8.8          110          00:02:37
  Distance: (default is 110)
  
```

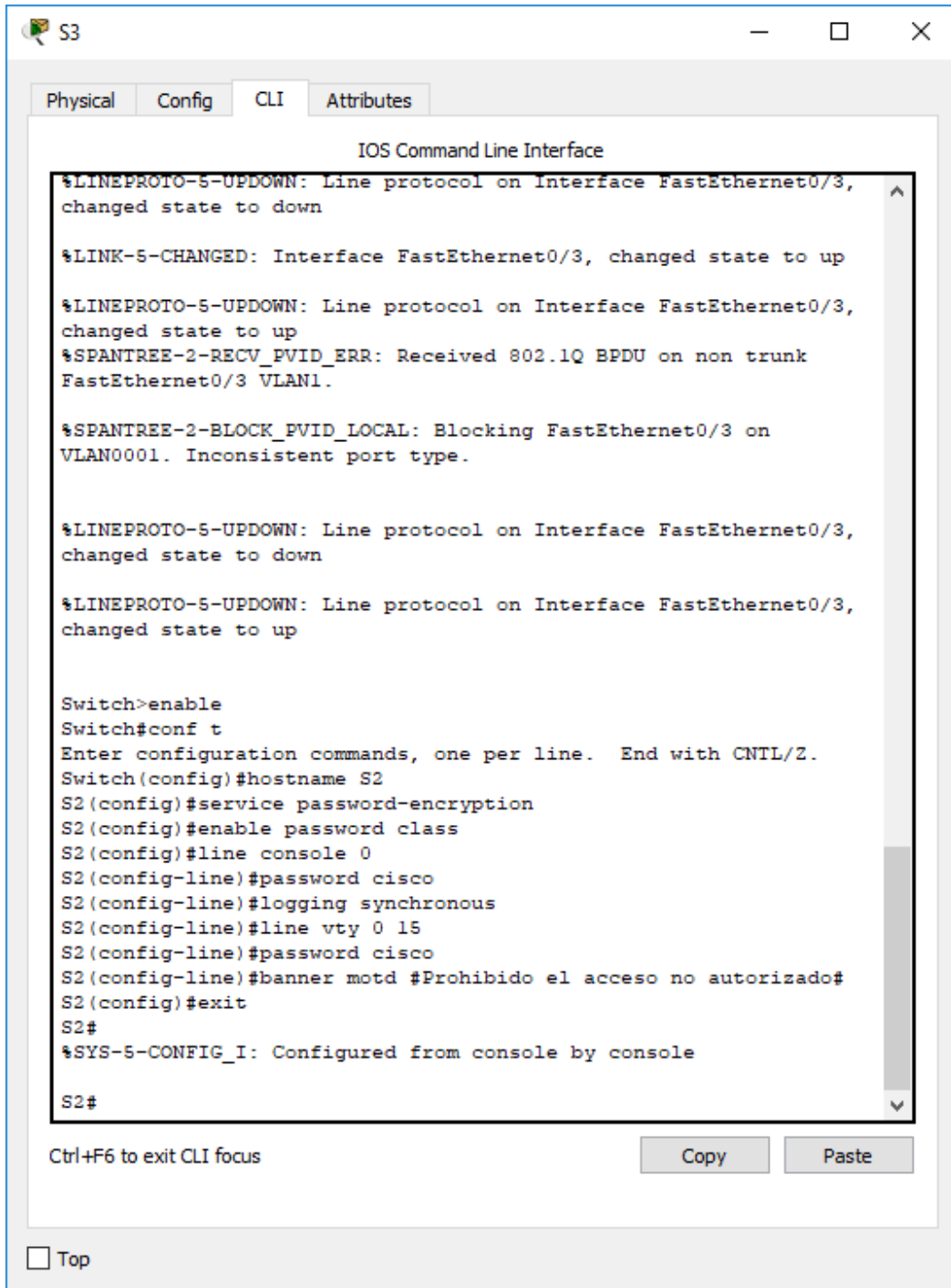
At the bottom of the terminal window, there are buttons for "Copy" and "Paste", and a "Top" button with a checkbox.



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



```
S1
Physical Config CLI Attributes
IOS Command Line Interface
^
% Invalid input detected at '^' marker.
S1(config-vlan)#name mercadeo
S1(config-vlan)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#int vlan 200
S1(config-if)#
%LINK-5-CHANGED: Interface Vlan200, changed state to up
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#exit
```



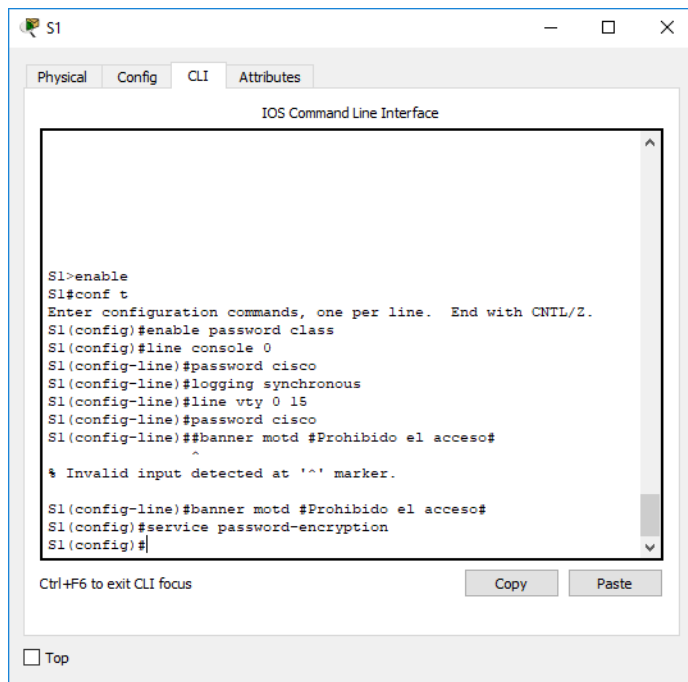
```
Switch>enable
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#service password-encryption
S2(config)#enable password class
S2(config)#line console 0
S2(config-line)#password cisco
S2(config-line)#logging synchronous
S2(config-line)#line vty 0 15
S2(config-line)#password cisco
S2(config-line)#banner motd #Prohibido el acceso no autorizado#
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console

S2#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



```

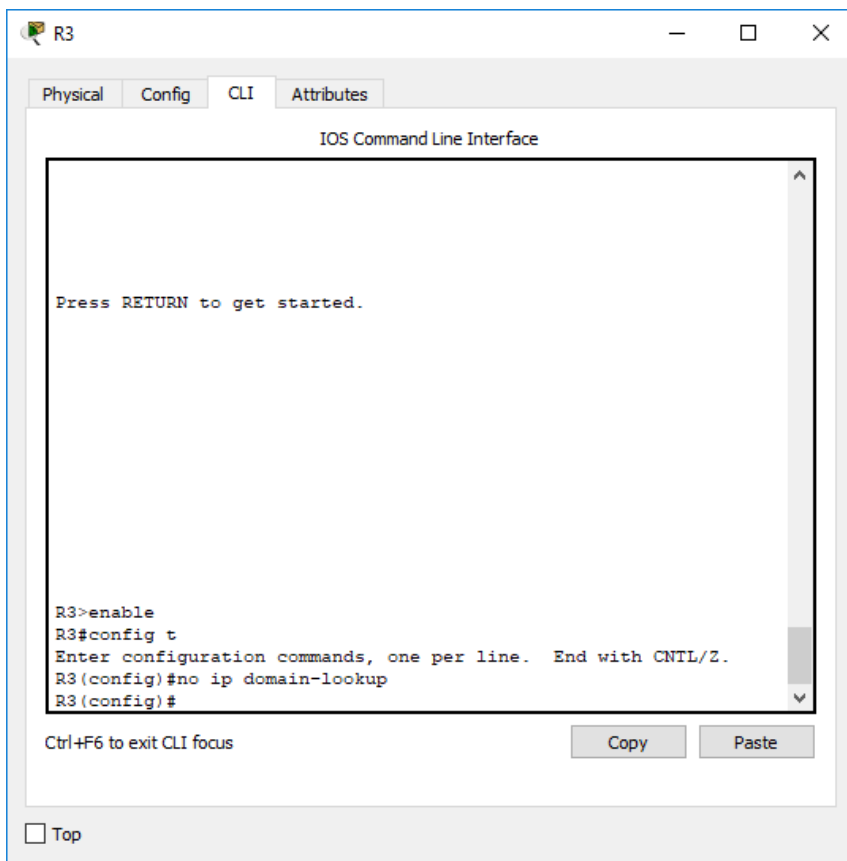
S1>enable
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#enable password class
S1(config)#line console 0
S1(config-line)#password cisco
S1(config-line)#logging synchronous
S1(config-line)#line vty 0 15
S1(config-line)#password cisco
S1(config-line)#banner motd #Prohibido el acceso#
^
% Invalid input detected at '^' marker.
S1(config-line)#banner motd #Prohibido el acceso#
S1(config)#service password-encryption
S1(config)#
  
```

Ctrl+F6 to exit CLI focus

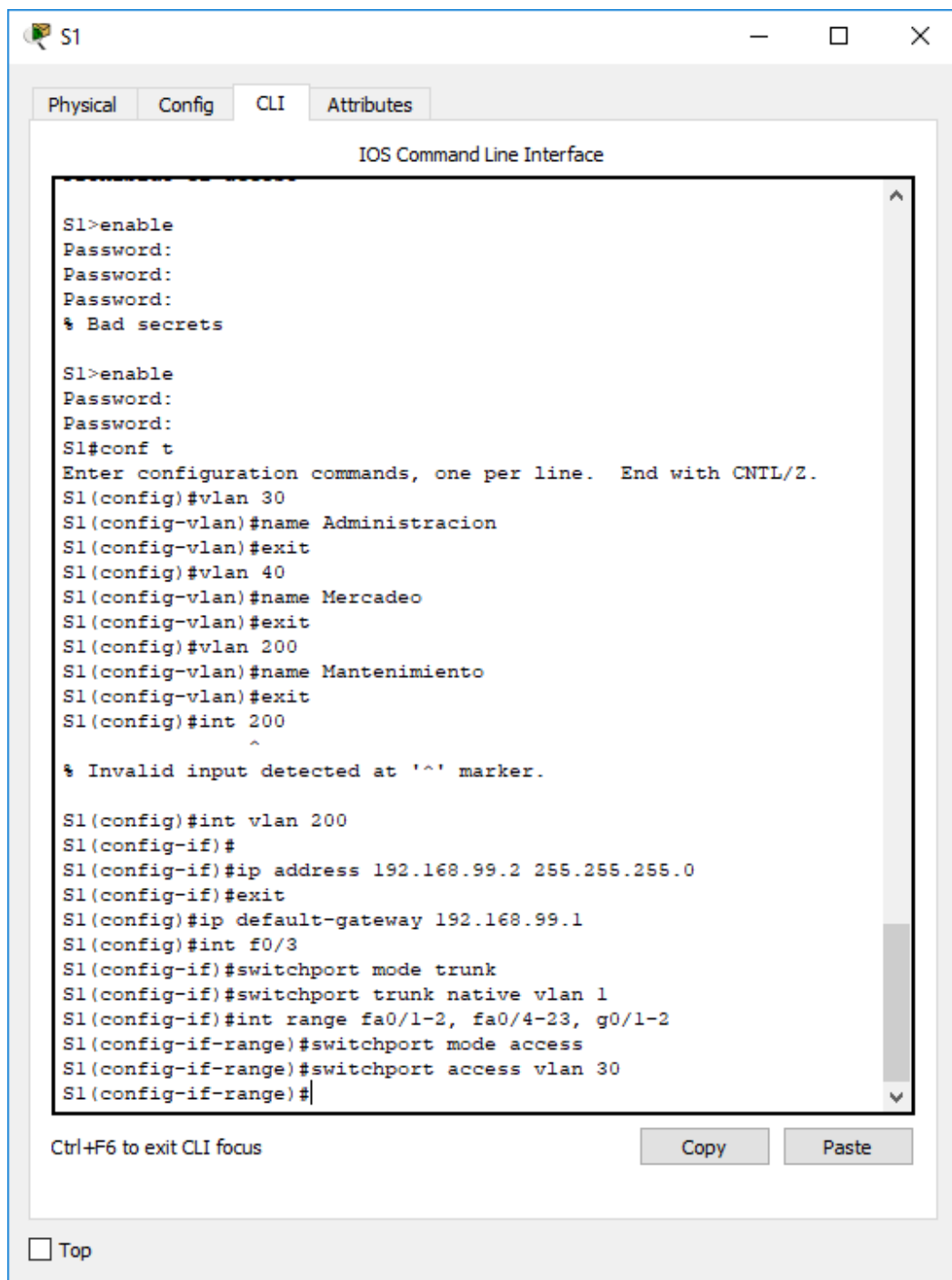
Copy Paste

Top

4. En el Switch 3 deshabilitar DNS lookup



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



```

S1>enable
Password:
Password:
Password:
% Bad secrets

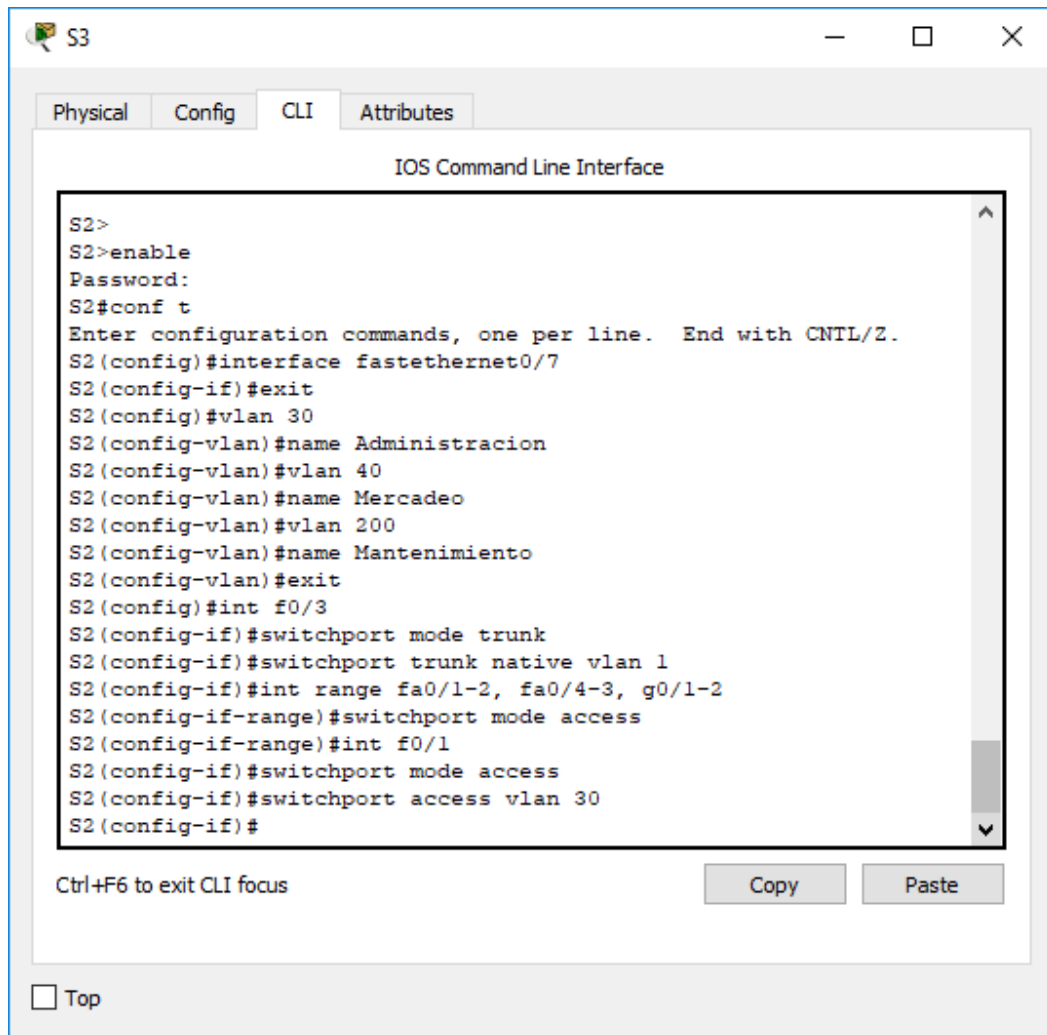
S1>enable
Password:
Password:
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#exit
S1(config)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#exit
S1(config)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#int 200
^
% Invalid input detected at '^' marker.

S1(config)#int vlan 200
S1(config-if)#
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4-23, g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 30
S1(config-if-range)#
  
```

Ctrl+F6 to exit CLI focus

Copy Paste

Top



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

S1>enable

Password:

Password:

Password:

% Bad secrets



```
S1>enable
Password:
Password:
S1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
S1(config)#vlan 30
S1(config-vlan)#name Administracion
S1(config-vlan)#exit
S1(config)#vlan 40
S1(config-vlan)#name Mercadeo
S1(config-vlan)#exit
S1(config)#vlan 200
S1(config-vlan)#name Mantenimiento
S1(config-vlan)#exit
S1(config)#int 200
      ^
% Invalid input detected at '^' marker.
```

```
S1(config)#int vlan 200
S1(config-if)#
S1(config-if)#ip address 192.168.99.2 255.255.255.0
S1(config-if)#exit
S1(config)#ip default-gateway 192.168.99.1
S1(config)#int f0/3
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk native vlan 1
S1(config-if)#int range fa0/1-2, fa0/4-23, g0/1-2
S1(config-if-range)#switchport mode access
S1(config-if-range)#switchport access vlan 30
S1(config-if-range)#exit
```

```
S1(config)#exit
```

```
S1#
```

7. Implement DHCP and NAT for IPv4

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

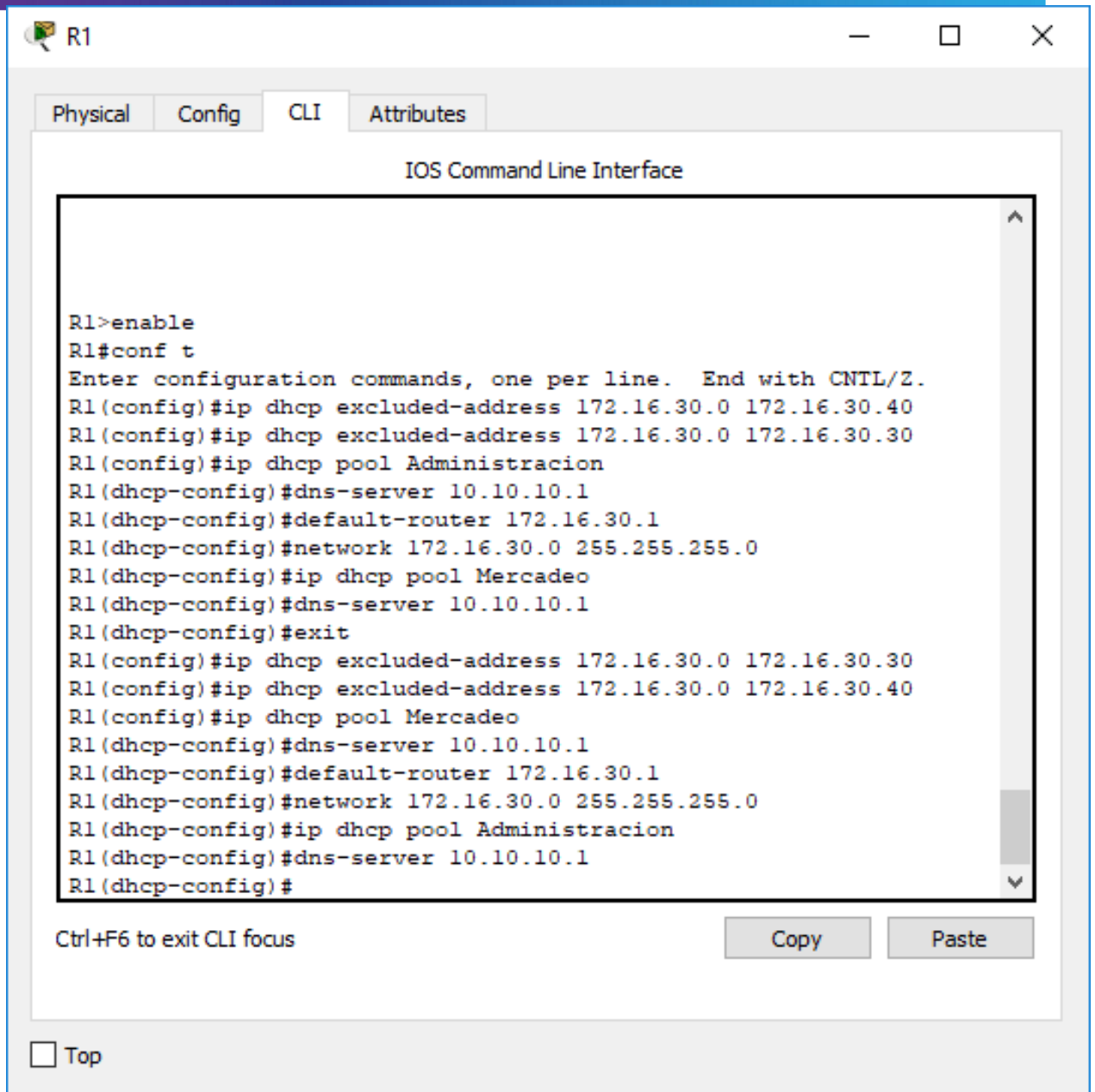
Configurar DHCP pool para VLAN 30	Name: ADMINISTRACION DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.
Configurar DHCP pool para VLAN 40	Name: MERCADEO DNS-Server: 10.10.10.11 Domain-Name: ccna-unad.com Establecer default gateway.



9.

The image shows two overlapping Cisco Packet Tracer windows. The top window, titled 'R3', is in the 'CLI' tab and shows the following commands: `R3>`, `R3>enable`, and `R3#conf t`. The bottom window, titled 'R1', is also in the 'CLI' tab and shows a sequence of commands for configuring DHCP pools: `R1>enable`, `R1#conf t`, `R1(config)#ip dhcp excluded-address 172.16.30.0 172.16.30.40`, `R1(config)#ip dhcp excluded-address 172.16.30.0 172.16.30.30`, `R1(config)#ip dhcp pool Administracion`, `R1(dhcp-config)#dns-server 10.10.10.1`, `R1(dhcp-config)#default-router 172.16.30.1`, `R1(dhcp-config)#network 172.16.30.0 255.255.255.0`, `R1(dhcp-config)#ip dhcp pool Mercadeo`, `R1(dhcp-config)#dns-server 10.10.10.1`, and `R1(dhcp-config)#`. Below the terminal area, there are 'Copy' and 'Paste' buttons, and a 'Top' button at the bottom left.

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

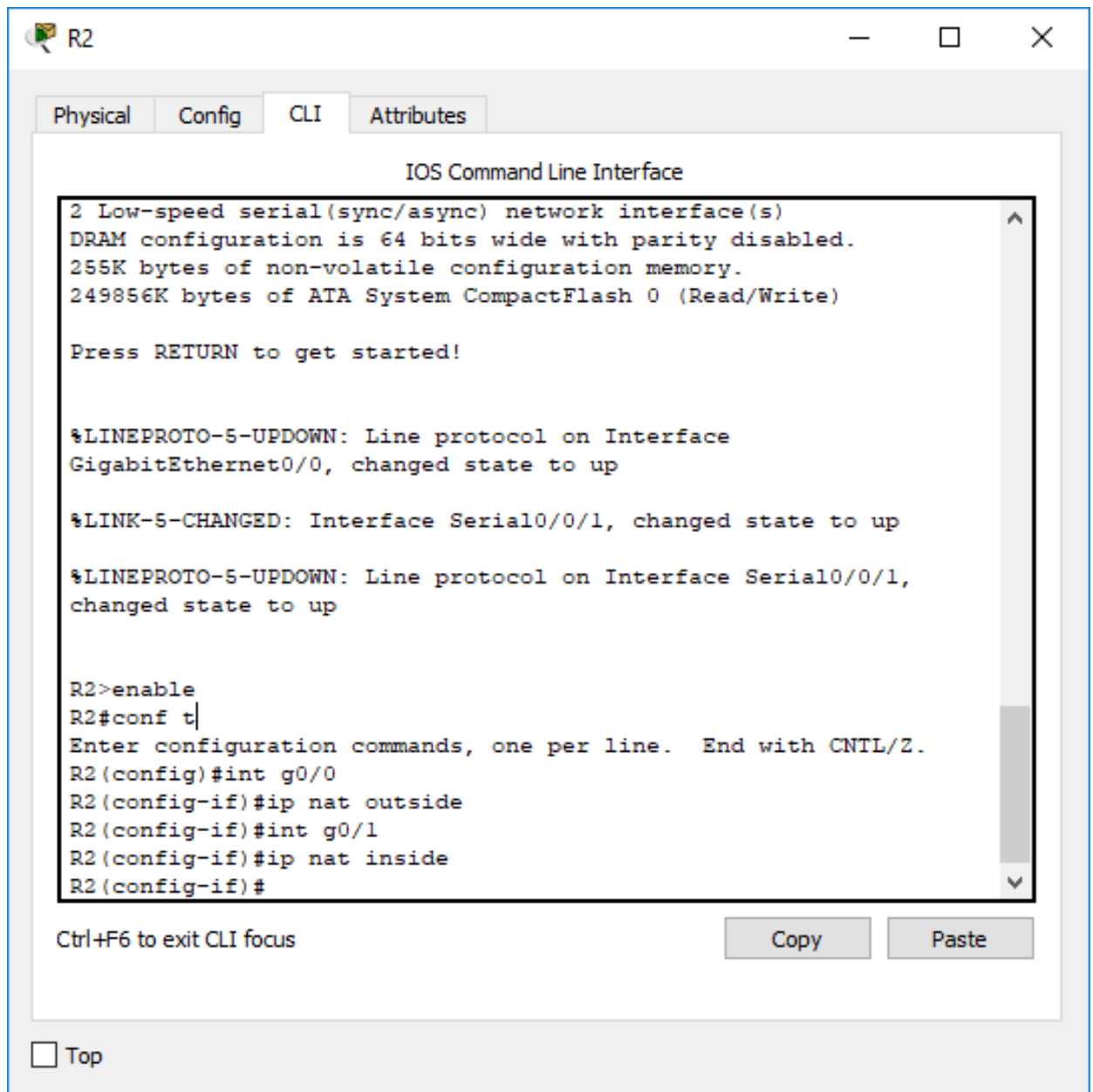


The screenshot shows a Cisco Packet Tracer window for a device named 'R1'. The window has tabs for 'Physical', 'Config', 'CLI', and 'Attributes', with 'CLI' selected. The main area is titled 'IOS Command Line Interface' and contains the following text:

```
R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip dhcp excluded-address 172.16.30.0 172.16.30.40
R1(config)#ip dhcp excluded-address 172.16.30.0 172.16.30.30
R1(config)#ip dhcp pool Administracion
R1(dhcp-config)#dns-server 10.10.10.1
R1(dhcp-config)#default-router 172.16.30.1
R1(dhcp-config)#network 172.16.30.0 255.255.255.0
R1(dhcp-config)#ip dhcp pool Mercadeo
R1(dhcp-config)#dns-server 10.10.10.1
R1(dhcp-config)#exit
R1(config)#ip dhcp excluded-address 172.16.30.0 172.16.30.30
R1(config)#ip dhcp excluded-address 172.16.30.0 172.16.30.40
R1(config)#ip dhcp pool Mercadeo
R1(dhcp-config)#dns-server 10.10.10.1
R1(dhcp-config)#default-router 172.16.30.1
R1(dhcp-config)#network 172.16.30.0 255.255.255.0
R1(dhcp-config)#ip dhcp pool Administracion
R1(dhcp-config)#dns-server 10.10.10.1
R1(dhcp-config)#
```

Below the CLI window, there is a text prompt 'Ctrl+F6 to exit CLI focus' and two buttons labeled 'Copy' and 'Paste'. At the bottom left of the window, there is a checkbox labeled 'Top'.

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



The screenshot shows a window titled "R2" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output shows the following commands and their results:

```
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!

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

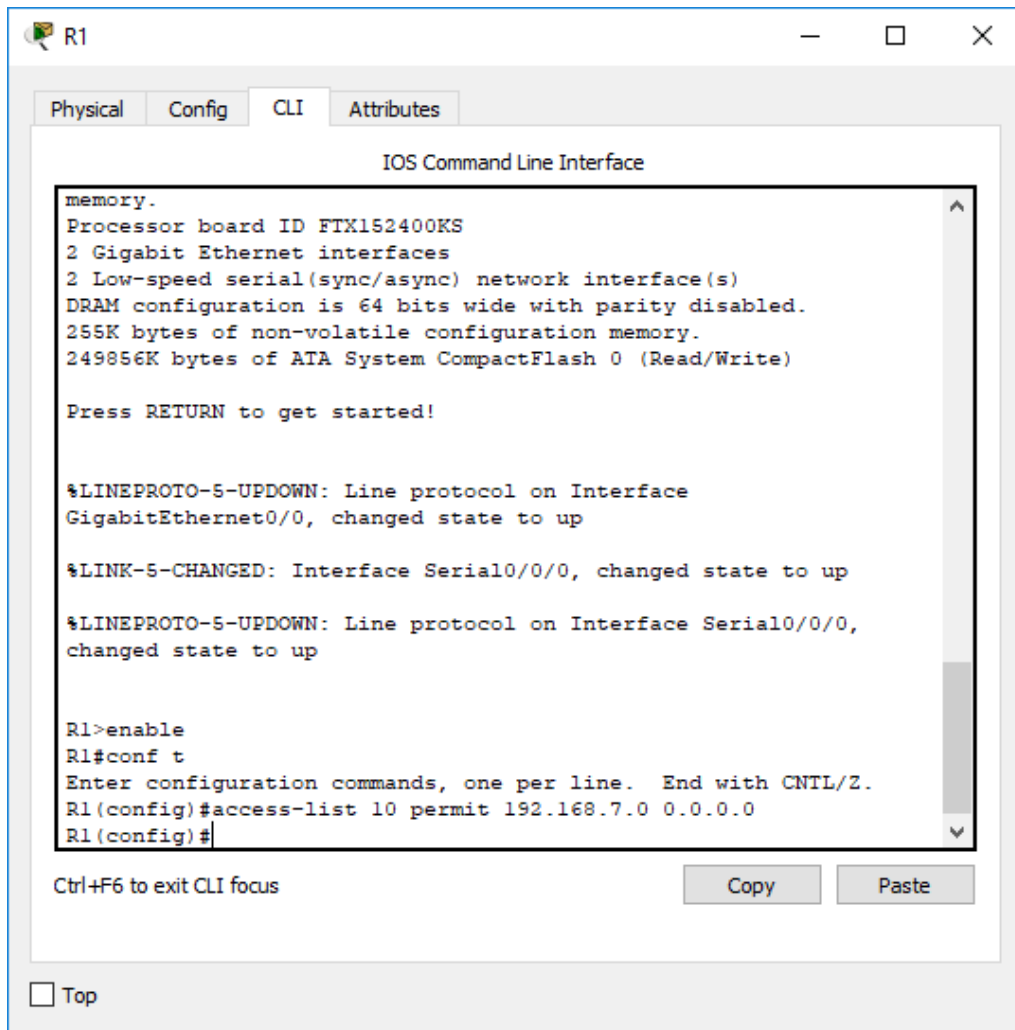
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

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

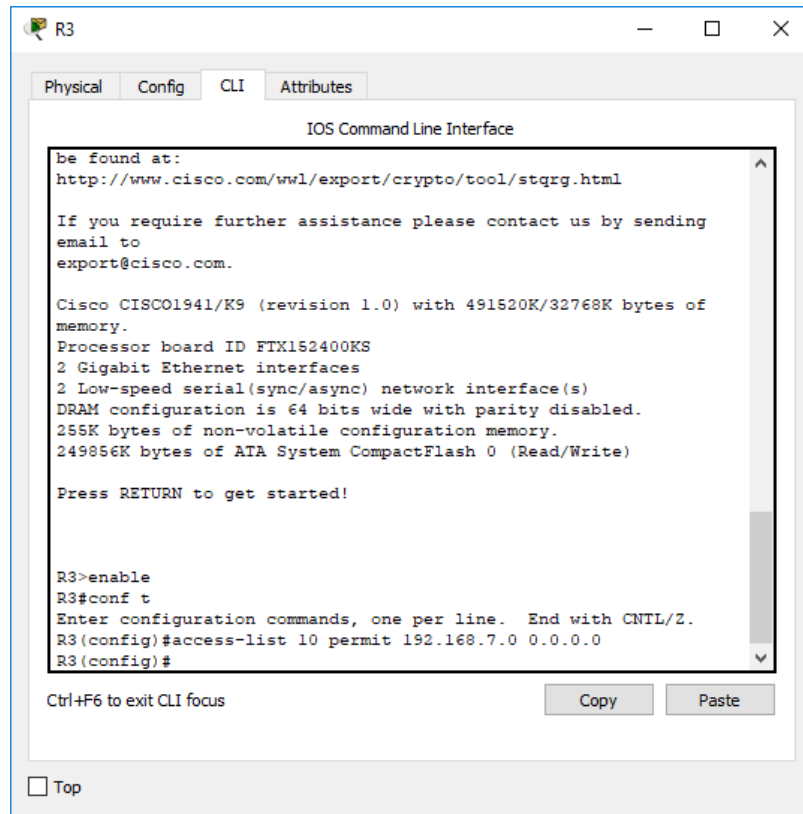
R2>enable
R2#conf t|
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int g0/0
R2(config-if)#ip nat outside
R2(config-if)#int g0/1
R2(config-if)#ip nat inside
R2(config-if)#
```

At the bottom of the CLI 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.

- 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.

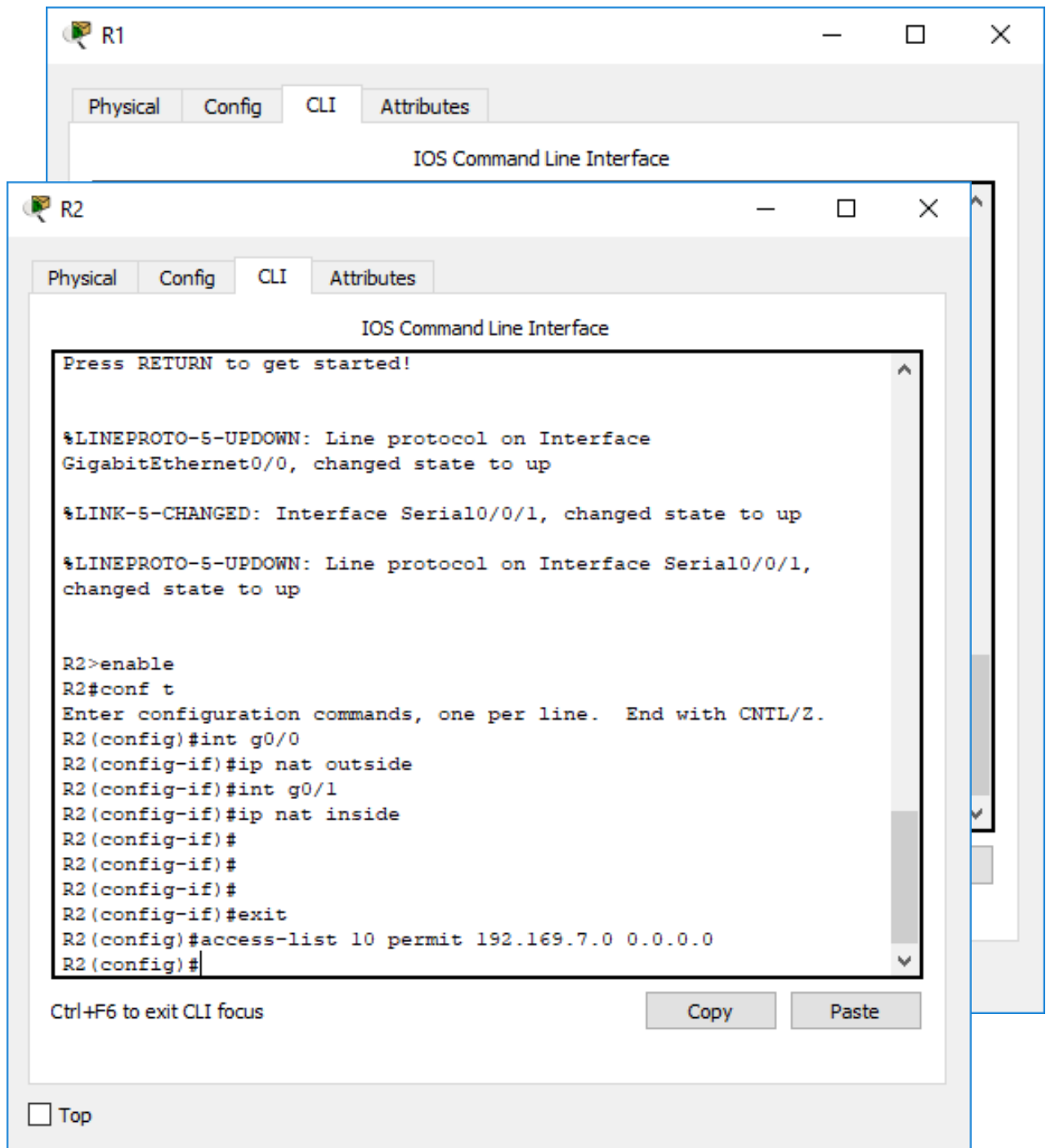


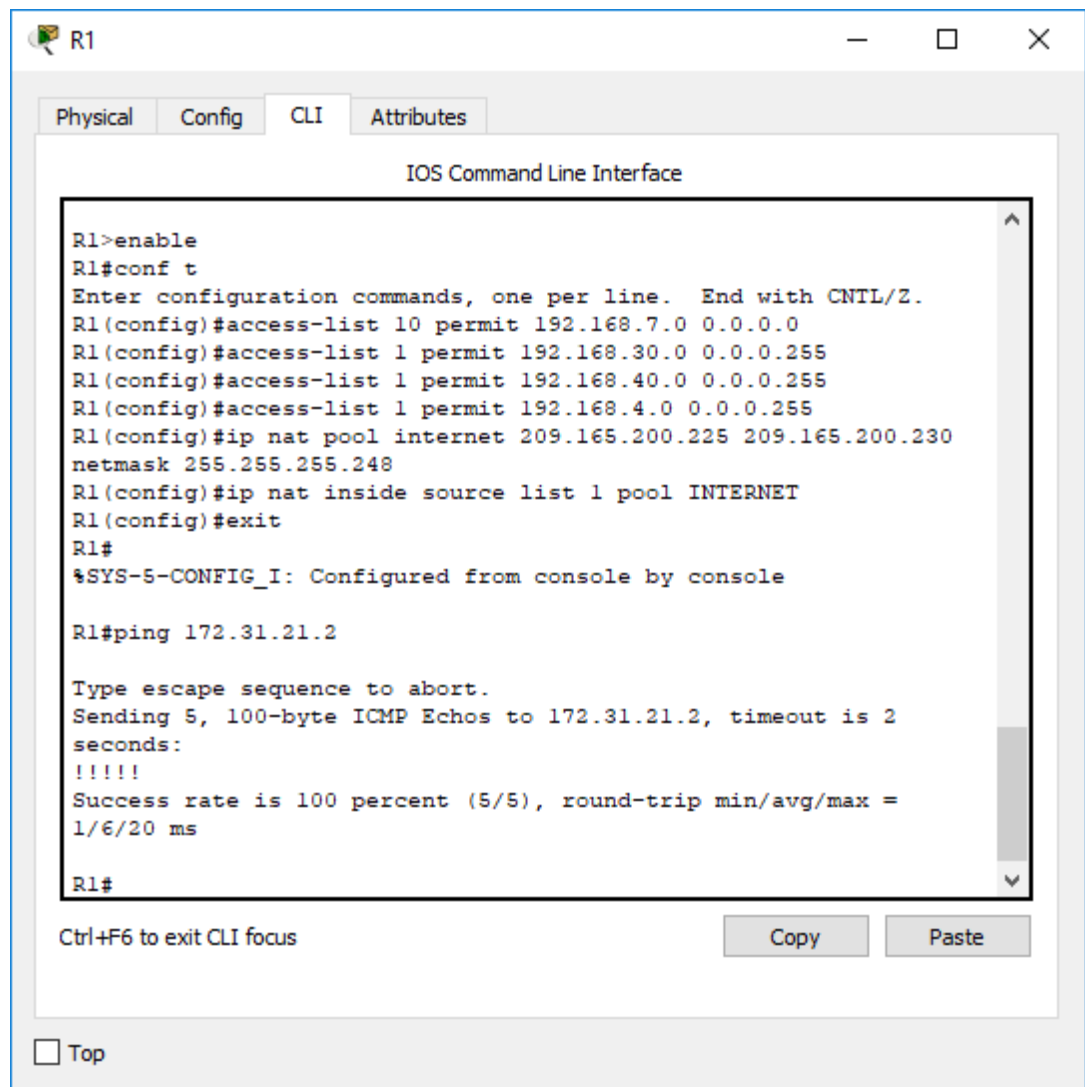
13. Configurar al menos dos listas de acceso de tipo extendido o nombradas a su criterio en para restringir o permitir tráfico desde R1 o R3 hacia R2.



```
R3
Physical Config CLI Attributes
IOS Command Line Interface
be found at:
http://www.cisco.com/wvl/export/crypto/tool/stqrg.html
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)
Press RETURN to get started!
R3>enable
R3#conf t
Enter configuration commands, one per line. End with CNTRL/Z.
R3(config)#access-list 10 permit 192.168.7.0 0.0.0.0
R3(config)#
Ctrl+F6 to exit CLI focus Copy Paste
Top
```

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





The screenshot shows a window titled "R1" with tabs for "Physical", "Config", "CLI", and "Attributes". The "CLI" tab is active, displaying the "IOS Command Line Interface". The terminal output is as follows:

```
R1>enable
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#access-list 10 permit 192.168.7.0 0.0.0.0
R1(config)#access-list 1 permit 192.168.30.0 0.0.0.255
R1(config)#access-list 1 permit 192.168.40.0 0.0.0.255
R1(config)#access-list 1 permit 192.168.4.0 0.0.0.255
R1(config)#ip nat pool internet 209.165.200.225 209.165.200.230
netmask 255.255.255.248
R1(config)#ip nat inside source list 1 pool INTERNET
R1(config)#exit
R1#
%SYS-5-CONFIG_I: Configured from console by console

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 =
1/6/20 ms

R1#
```

Below the terminal window, there is a "Ctrl+F6 to exit CLI focus" label, "Copy" and "Paste" buttons, and a "Top" button with a checkbox.