

Instituto Tecnológico de Salina Cruz

Fundamentos de Redes

Semestre Enero – Julio 2015

Reporte de Practica

Practica n° 5

Unidad 2

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Fecha: 18 de Marzo del 2015

Objetivo:

Realizar las actividades que se mencionaran a continuación y comprobar su conexión mediante un escenario.

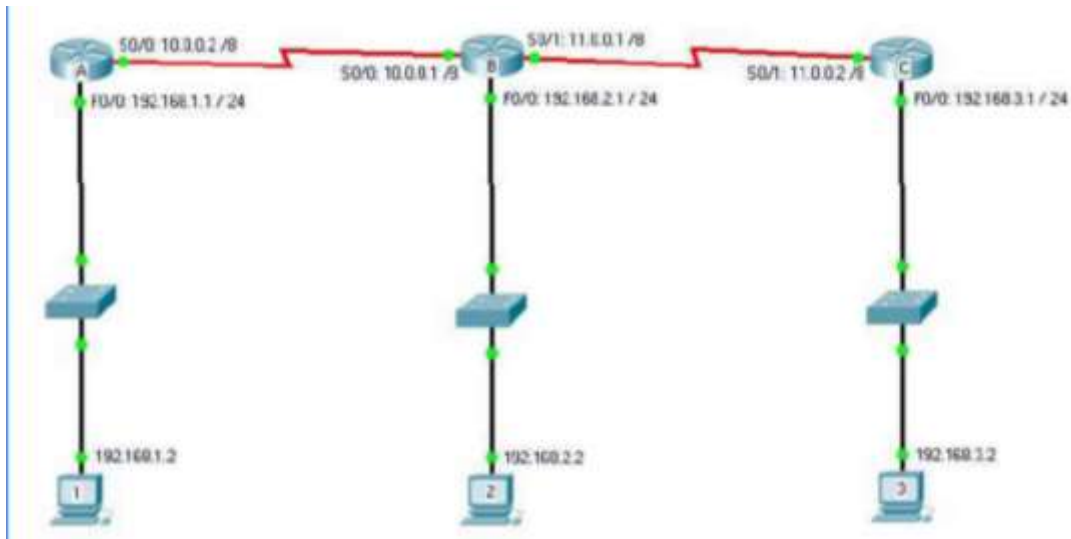
Instrucciones:

En la siguiente práctica se conocerá los comandos básicos de un router Cisco, empleando el simulador Packet Tracer, ya que ésta es una herramienta que permite el diseño, la construcción y la configuración directa de diversos dispositivos de una red.

Materiales:

Programa de simulacion Packet Tracer

INSTITUTO TECNOLÓGICO DE SALINA CRUZ
REDES DE COMPUTADORAS
PRACTICAS UNIDAD 2



PASO 1

Construir la tabla de direccionamiento

<i>Dispositivo</i>	<i>Interfaz</i>	<i>Dirección IP</i>	<i>Mascara de subred</i>	<i>Gateway</i>
<i>R1</i>	<i>Fa0/0</i>	<i>192.168.1.1</i>	<i>255.255.255.0</i>	<i>No aplicable</i>
	<i>S2/0</i>	<i>10.0.0.2</i>	<i>255.0.0.0</i>	<i>No aplicable</i>
<i>R2</i>	<i>Fa0/0</i>	<i>192.168.2.1</i>	<i>255.255.255.0</i>	<i>No aplicable</i>
	<i>S2/0</i>	<i>10.0.0.1</i>	<i>255.0.0.0</i>	<i>No aplicable</i>
	<i>S3/0</i>	<i>11.0.0.1</i>	<i>255.0.0.0</i>	<i>No aplicable</i>
<i>R3</i>	<i>Fa0/0</i>	<i>192.168.3.1</i>	<i>255.255.255.0</i>	<i>No aplicable</i>
	<i>S2/0</i>	<i>11.0.0.2</i>	<i>255.0.0.0</i>	<i>No aplicable</i>
<i>PC1</i>	<i>No aplicable</i>	<i>192.168.1.2</i>	<i>255.255.255.0</i>	<i>192.168.1.1</i>
<i>PC2</i>	<i>No aplicable</i>	<i>192.168.2.2</i>	<i>255.255.255.0</i>	<i>192.168.1.2</i>
<i>PC3</i>	<i>No aplicable</i>	<i>192.168.3.2</i>	<i>255.255.255.0</i>	<i>192.168.1.3</i>

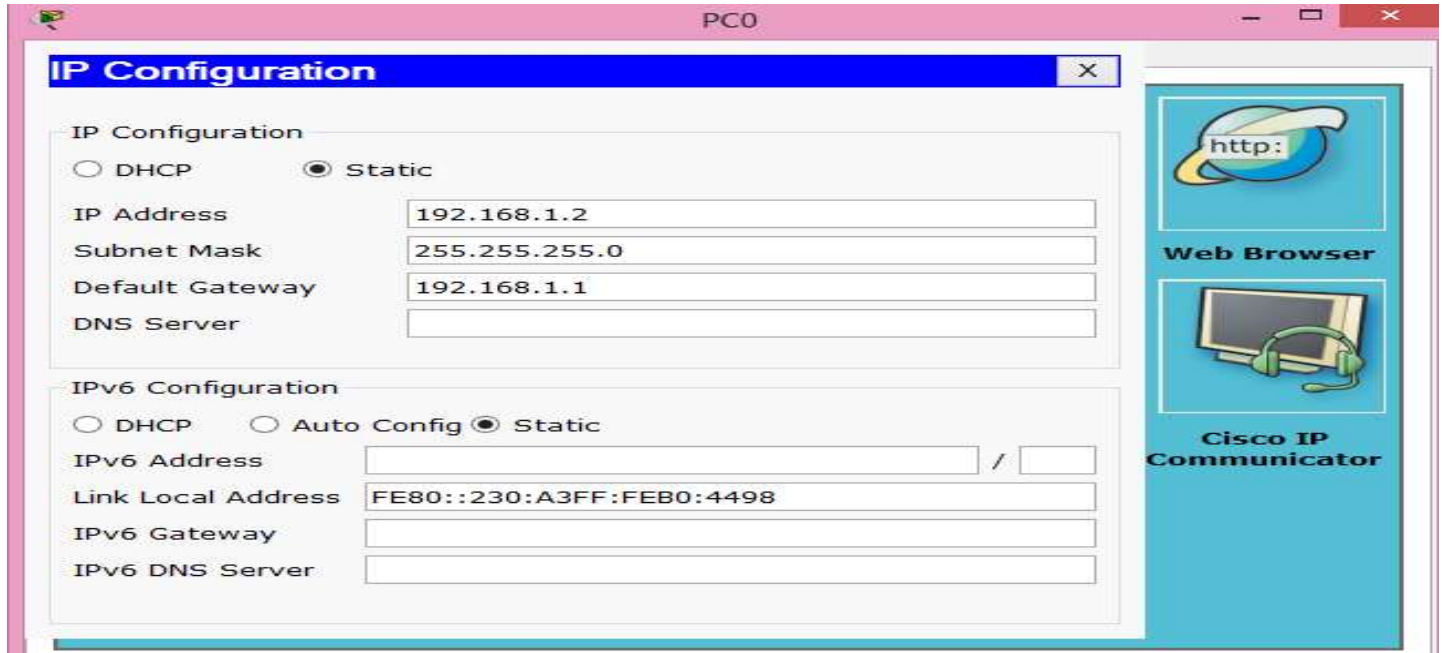
PASO 2

CONFIGURACIÓN INICIAL

A) HOST

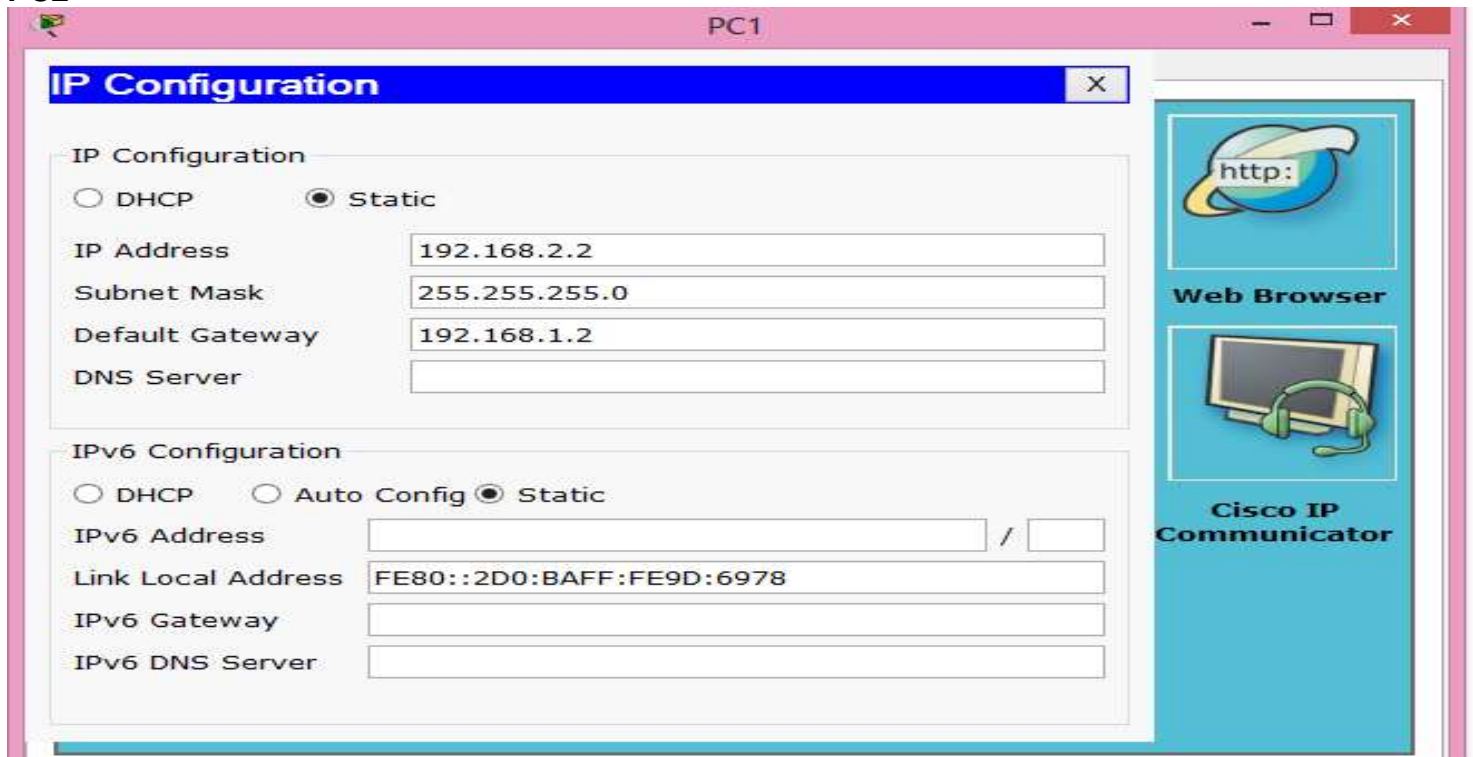
***Agregar puerta de enlace**

PC1



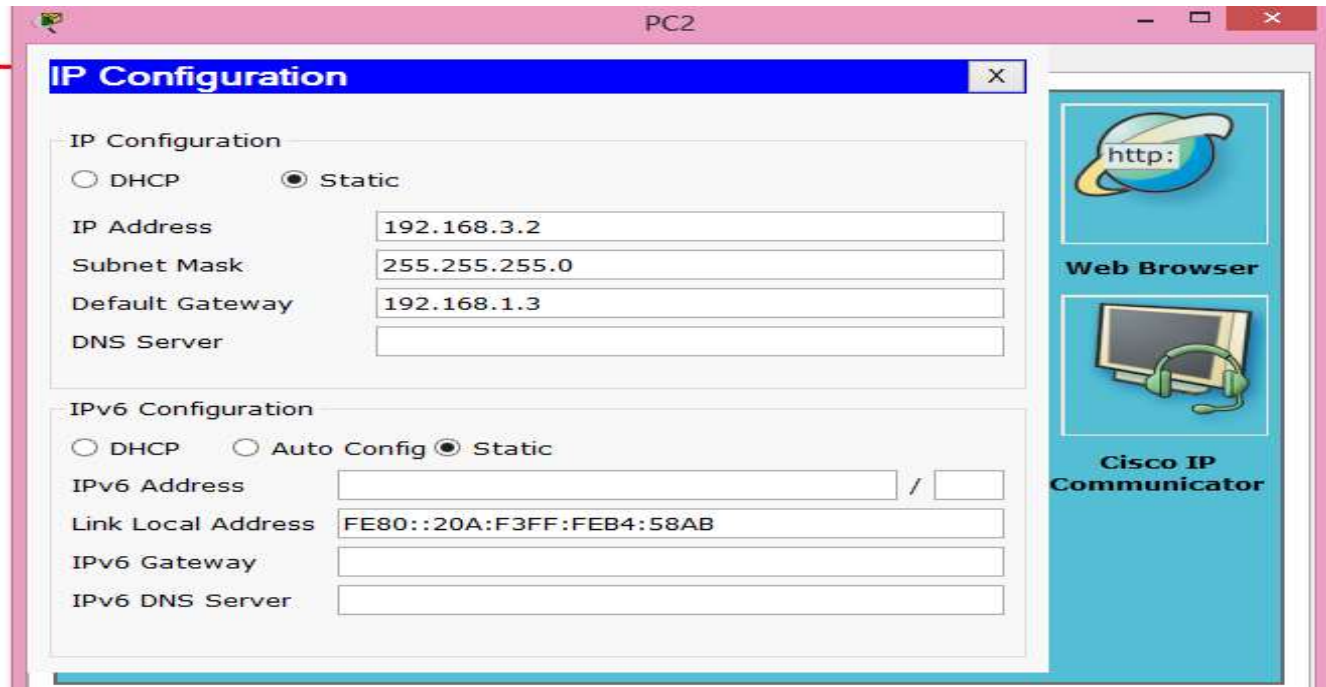
The screenshot shows the IP Configuration window for PC0. The window title is "PC0". The main title bar is "IP Configuration". Under "IP Configuration", the "Static" radio button is selected. The fields are: IP Address: 192.168.1.2, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.1.1, and DNS Server: (empty). Under "IPv6 Configuration", the "Static" radio button is selected. The fields are: IPv6 Address: (empty), Link Local Address: FE80::230:A3FF:FEB0:4498, IPv6 Gateway: (empty), and IPv6 DNS Server: (empty). On the right side, there are two icons: "Web Browser" with an "http:" icon and "Cisco IP Communicator" with a headset icon.

PC2



The screenshot shows the IP Configuration window for PC1. The window title is "PC1". The main title bar is "IP Configuration". Under "IP Configuration", the "Static" radio button is selected. The fields are: IP Address: 192.168.2.2, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.1.2, and DNS Server: (empty). Under "IPv6 Configuration", the "Static" radio button is selected. The fields are: IPv6 Address: (empty), Link Local Address: FE80::2D0:BAFF:FE9D:6978, IPv6 Gateway: (empty), and IPv6 DNS Server: (empty). On the right side, there are two icons: "Web Browser" with an "http:" icon and "Cisco IP Communicator" with a headset icon.

PC3



B) RUTEADORES

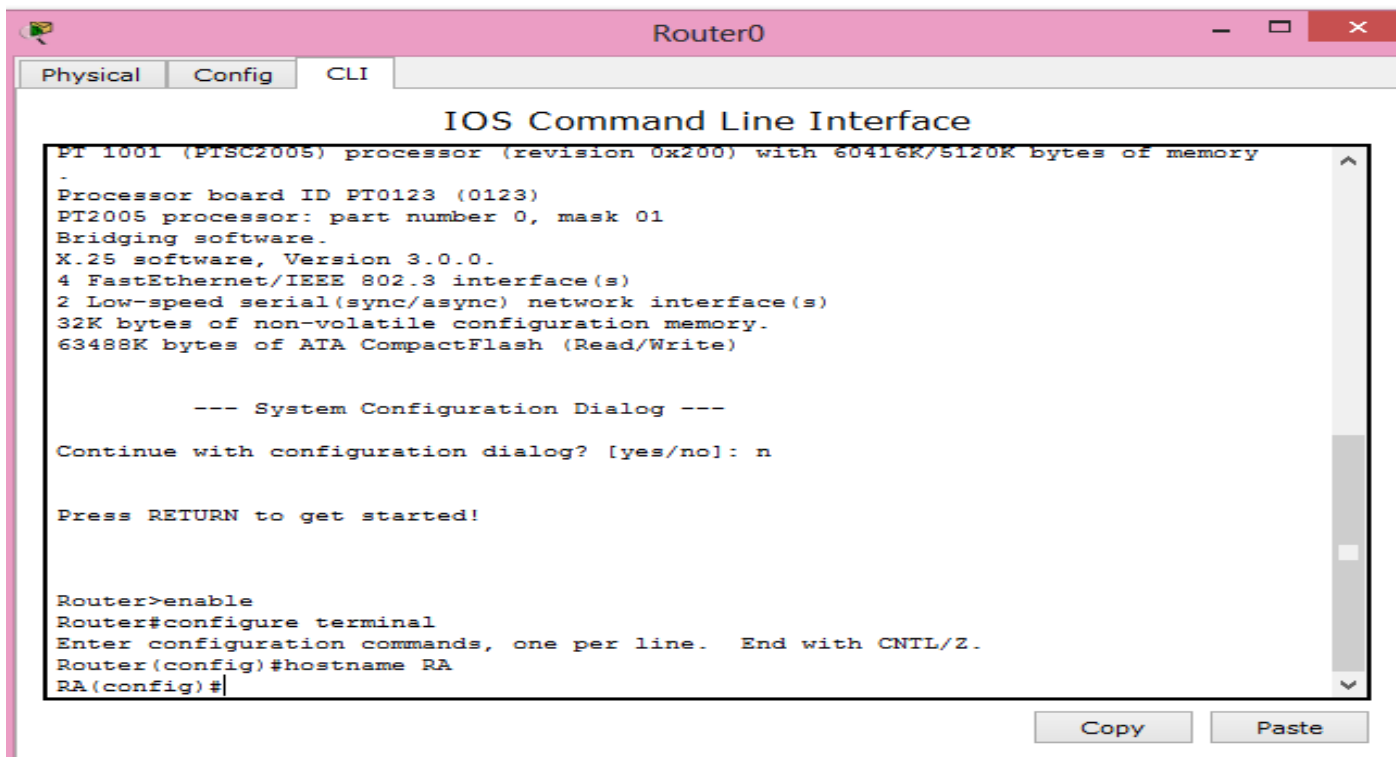
- Todo lo indicado en las prácticas iniciales.

Nombres: RA, RB y RC

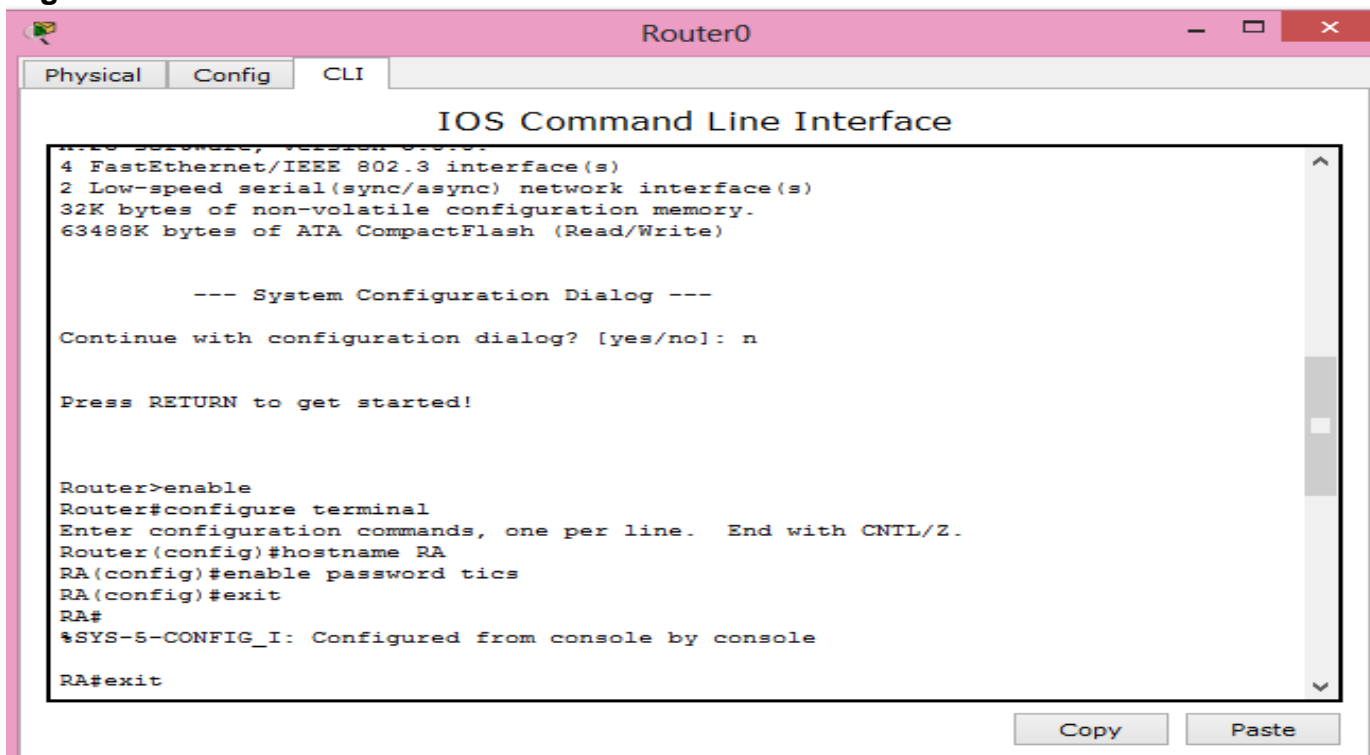
Password diferente para cada ruteador

Router1 (RA)

Cambio de nombre.



Configuración de la contraseña.



Configuración del banner.

IOS Command Line Interface

```
RA con0 is now available
```

```
Press RETURN to get started.
```

```
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```

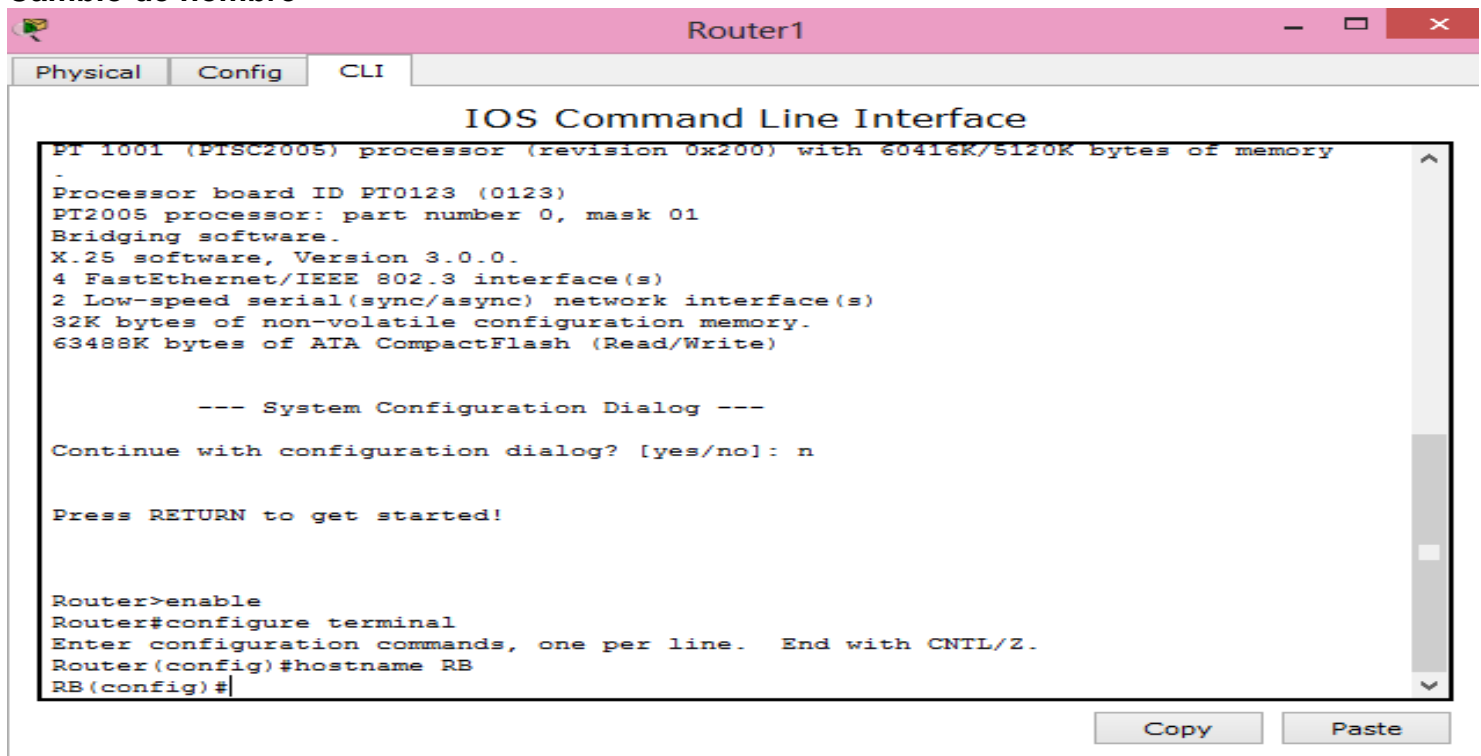
```
banner motd
```

```
RA>|
```

Copy

Paste

Router2 (RB) Cambio de nombre



The screenshot shows the Router1 CLI interface with the following text:

```
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
-
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---

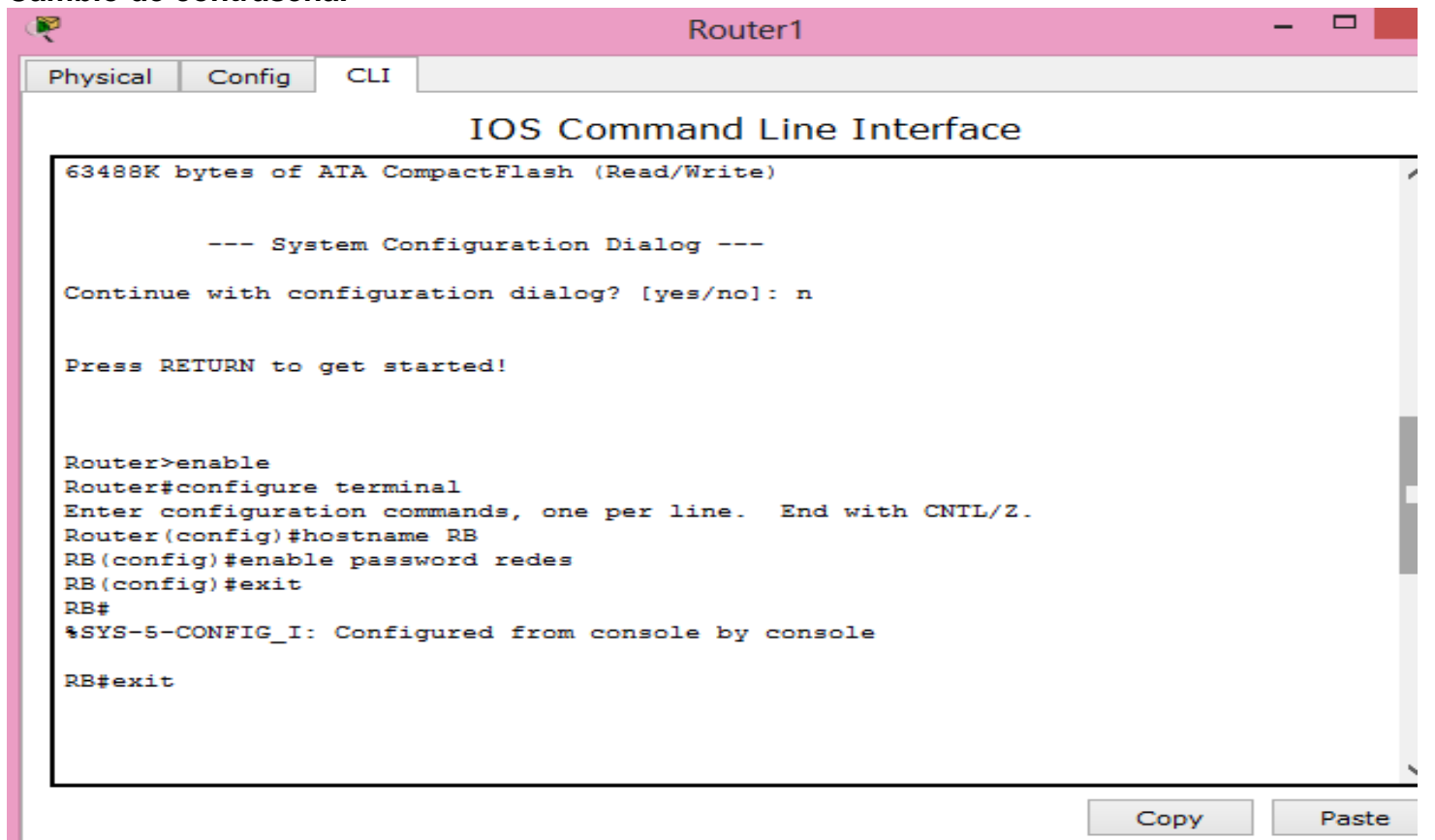
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

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

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

Cambio de contraseña.



The screenshot shows the Router1 CLI interface with the following text:

```
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: n

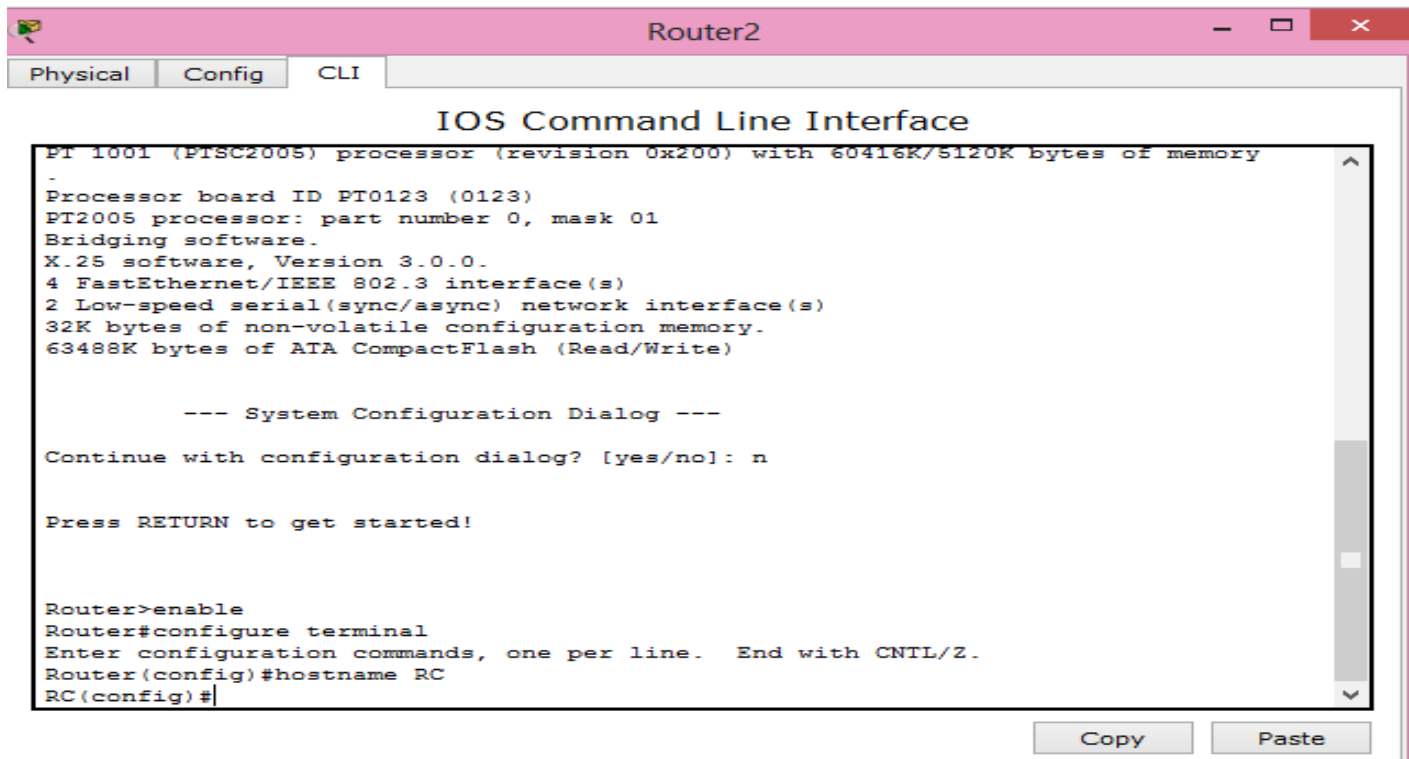
Press RETURN to get started!

Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname RB
RB(config)#enable password redes
RB(config)#exit
RB#
%SYS-5-CONFIG_I: Configured from console by console

RB#exit
```

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

Router3 (RC). Cambio de nombre.



The screenshot shows the Router2 CLI interface. The window title is "Router2". The tabs are "Physical", "Config", and "CLI". The main content is the "IOS Command Line Interface". The text displayed is:

```
PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
-
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---

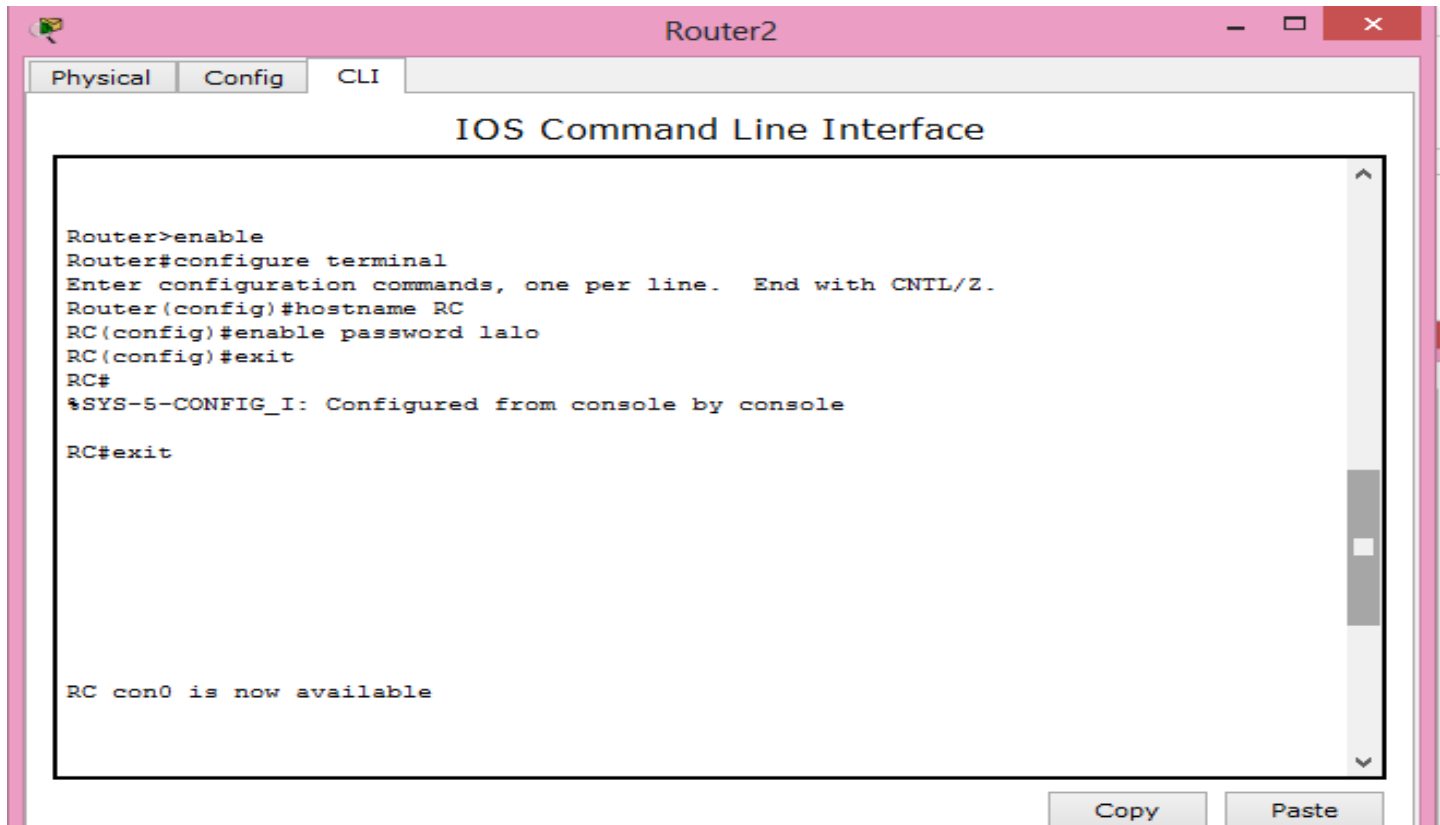
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

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

At the bottom right, there are "Copy" and "Paste" buttons.

Cambio de contraseña



The screenshot shows the Router2 CLI interface. The window title is "Router2". The tabs are "Physical", "Config", and "CLI". The main content is the "IOS Command Line Interface". The text displayed is:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname RC
RC(config)#enable password lalo
RC(config)#exit
RC#
%SYS-5-CONFIG_I: Configured from console by console

RC#exit

RC con0 is now available
```

At the bottom right, there are "Copy" and "Paste" buttons.

PASO 3

- a) Desde cada ruteador usar el comando "show cdp neighbors" para verificar que todas las interfaces estén activas.

RA.

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
RA(config-if)#interface s2/0
RA(config-if)#ip address 10.0.0.2 255.0.0.0
RA(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
RA(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

RA(config-if)#EXIT
RA(config)#EXIT
RA#
%SYS-5-CONFIG_I: Configured from console by console

RA#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID      Local Intrfce  Holdtme    Capability  Platform  Port ID
Switch        Fas 0/0       158        S           2950      Fas 0/1
RB            Ser 2/0       149        R           PT1000    Ser 2/0
RA#
```

Copy

Paste

RB

Router1

Physical Config CLI

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
3/0
RB(config-if)#interface s3/0
RB(config-if)#ip address 11.0.0.1 255.0.0.0
RB(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
RB(config-if)#
RB(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

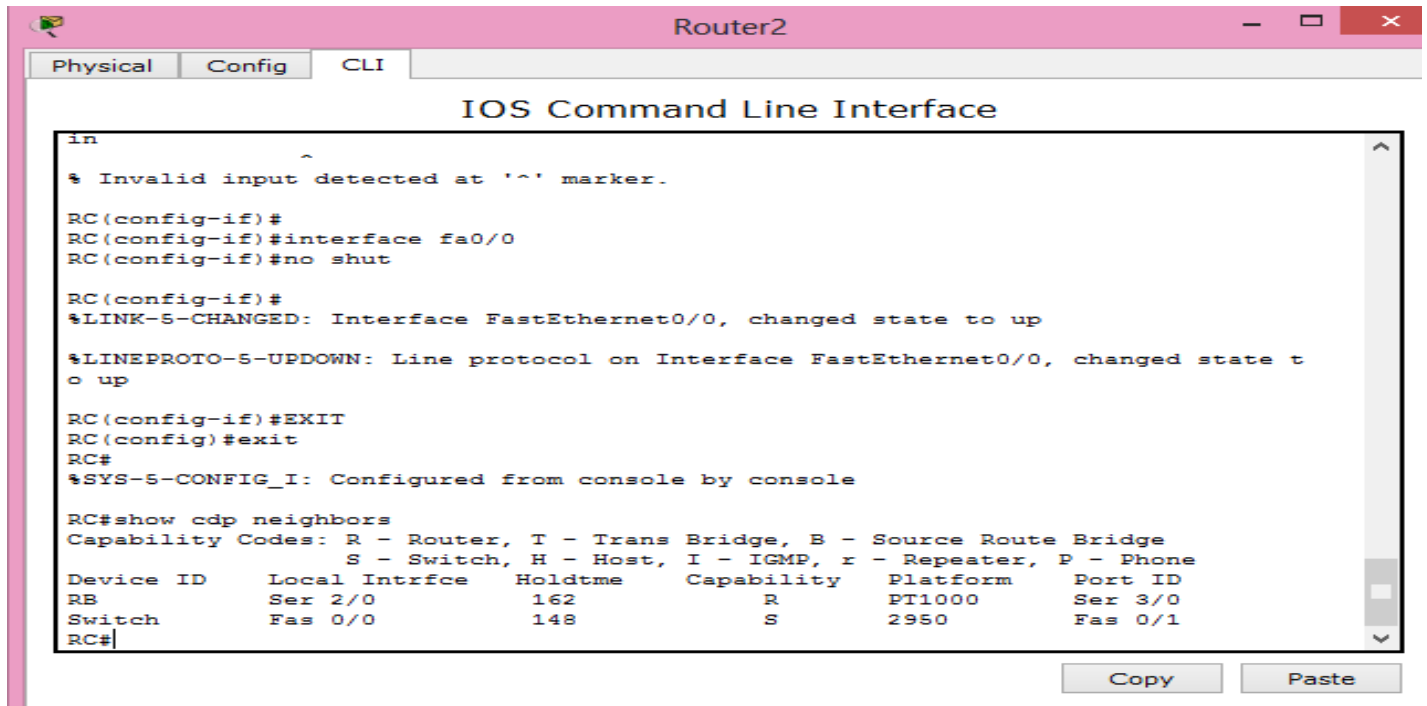
RB(config-if)#exit
RB(config)#exit
RB#
%SYS-5-CONFIG_I: Configured from console by console

RB#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID      Local Intrfce  Holdtme    Capability  Platform  Port ID
Switch        Fas 0/0       175        S           2950      Fas 0/1
RA            Ser 2/0       152        R           PT1000    Ser 2/0
RC            Ser 3/0       160        R           PT1000    Ser 2/0
RB#
```

Copy

Paste

RC



The screenshot shows the Router2 CLI interface with the following text:

```
in
% Invalid input detected at '^' marker.
RC(config-if)#
RC(config-if)#interface fa0/0
RC(config-if)#no shut

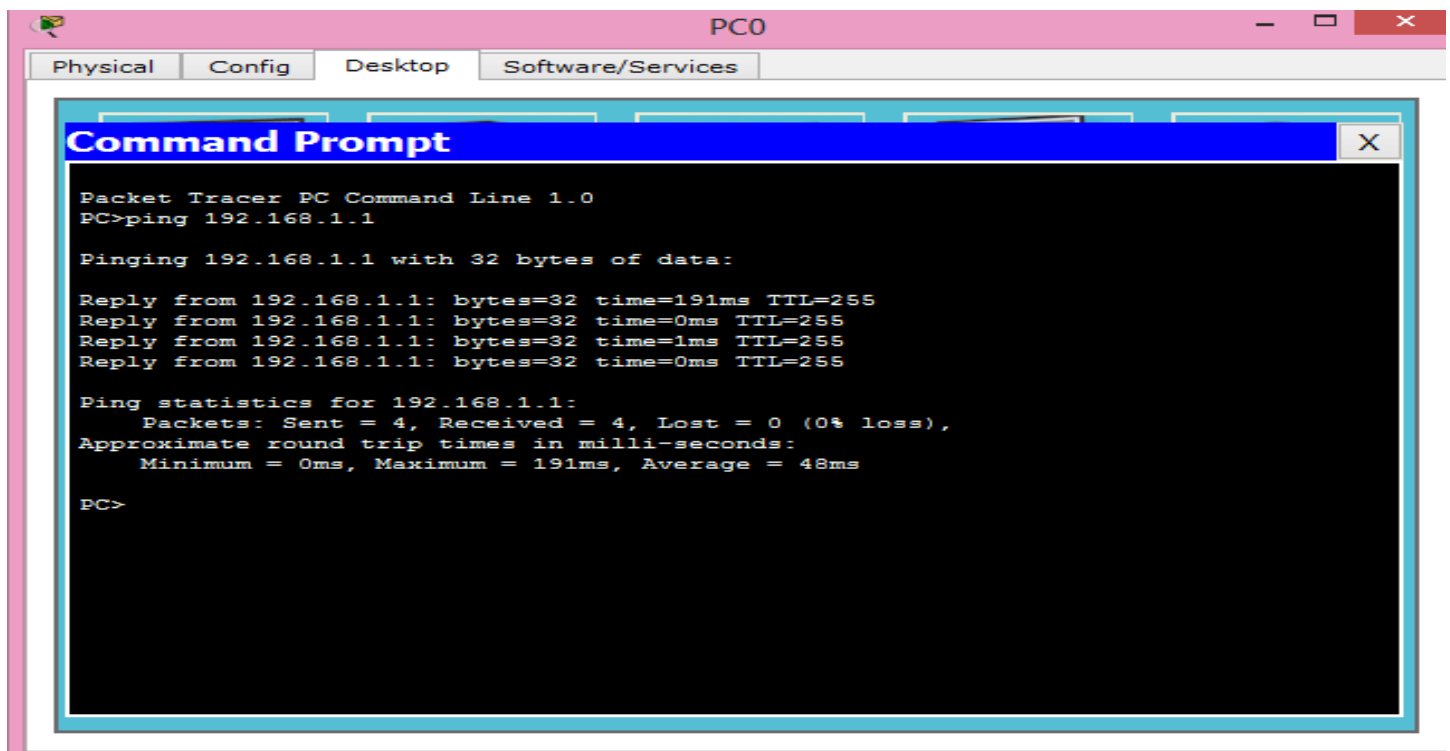
RC(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

RC(config-if)#EXIT
RC(config)#exit
RC#
%SYS-5-CONFIG_I: Configured from console by console

RC#show cdp neighbors
Capability Codes: R - Router, T - Trans Bridge, B - Source Route Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater, P - Phone
Device ID         Local Intrfce   Holdtme    Capability   Platform     Port ID
RB                 Ser 2/0         162        R            PT1000       Ser 3/0
Switch            Fas 0/0         148        S            2950         Fas 0/1
RC#
```

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

- b) Verificar la puerta de enlace del red “default gateway”, haciendo un ping desde un host a la IP de la interfaz del router conectada a la red a la que pertenece el host. PC1 a RA



The screenshot shows the PC0 Command Prompt with the following text:

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.1.1

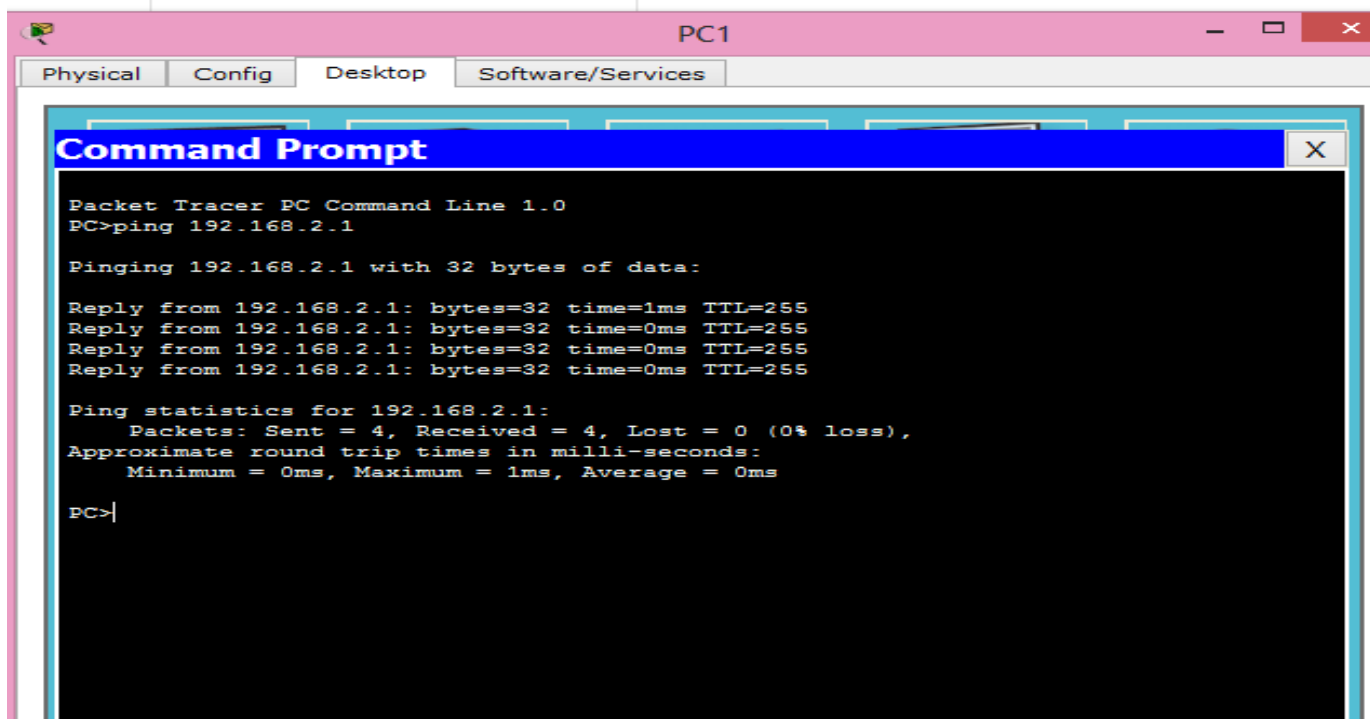
Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=191ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255
Reply from 192.168.1.1: bytes=32 time=1ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 191ms, Average = 48ms

PC>
```

PC2 a RB



The screenshot shows a Packet Tracer PC window for PC1. The window has tabs for Physical, Config, Desktop, and Software/Services. A Command Prompt window is open, displaying the output of a ping command to 192.168.2.1. The output shows four successful replies with 32 bytes of data, a time of 1ms, and a TTL of 255. Ping statistics indicate 4 packets sent, 4 received, and 0% loss.

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.2.1

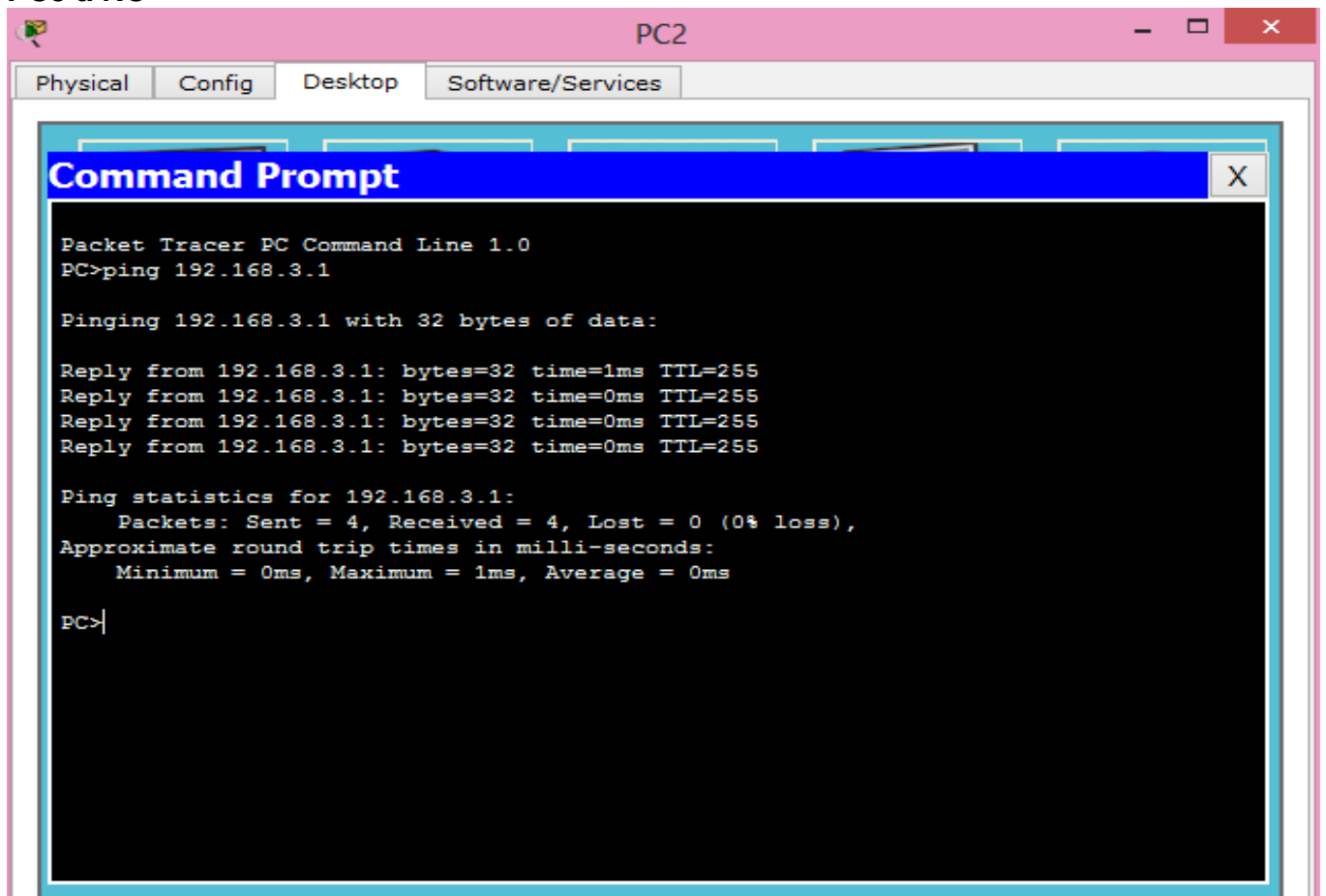
Pinging 192.168.2.1 with 32 bytes of data:

Reply from 192.168.2.1: bytes=32 time=1ms TTL=255
Reply from 192.168.2.1: bytes=32 time=0ms TTL=255
Reply from 192.168.2.1: bytes=32 time=0ms TTL=255
Reply from 192.168.2.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PC3 a RC



The screenshot shows a Packet Tracer PC window for PC2. The window has tabs for Physical, Config, Desktop, and Software/Services. A Command Prompt window is open, displaying the output of a ping command to 192.168.3.1. The output shows four successful replies with 32 bytes of data, a time of 1ms, and a TTL of 255. Ping statistics indicate 4 packets sent, 4 received, and 0% loss.

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.3.1

Pinging 192.168.3.1 with 32 bytes of data:

Reply from 192.168.3.1: bytes=32 time=1ms TTL=255
Reply from 192.168.3.1: bytes=32 time=0ms TTL=255
Reply from 192.168.3.1: bytes=32 time=0ms TTL=255
Reply from 192.168.3.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>
```

PASO 3

Configurar Rutas Estáticas

- a) IP del siguiente salto
- b) Interfaz desalida

NOTA: Normalmente se usa la “IP del siguiente salto” que es la IP de la interfaz del router directamente conectado, pero si entre los datos no se tiene, se puede usar la “interfaz de salida” que es la interfaz del router local. No hay forma de hacer rutas estáticas sin conocer la dirección de red destino, para ese caso se usan “rutas por defecto” o un “default gateway” en el router.

A) Configurar Rutas Estáticas Utilizando la “IP del Siguiente Salto”

Router A

```
RouterA>enable
RouterA#config terminal
RouterA(config)#ip route 192.168.2.0 255.255.255.0 10.0.0.1
RouterA(config)#ip route 192.168.3.0 255.255.255.0 10.0.0.1
```

```
Router0
Physical Config CLI
IOS Command Line Interface

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RA>enable
Password:
RA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RA(config)#ip route 192.168.2.0 255.255.255.0 10.0.0.1
% Invalid input detected at '^' marker.
RA(config)#ip route 192.168.2.0 255.255.255.0
% Invalid input detected at '^' marker.
RA(config)#ip route 192.168.2.0 255.255.255.0
% Incomplete command.
RA(config)#ip route 192.168.2.0 255.255.255.0
% Incomplete command.
RA(config)#ip route 192.168.2.0 255.255.255.0 10.0.0.1
RA(config)#
```

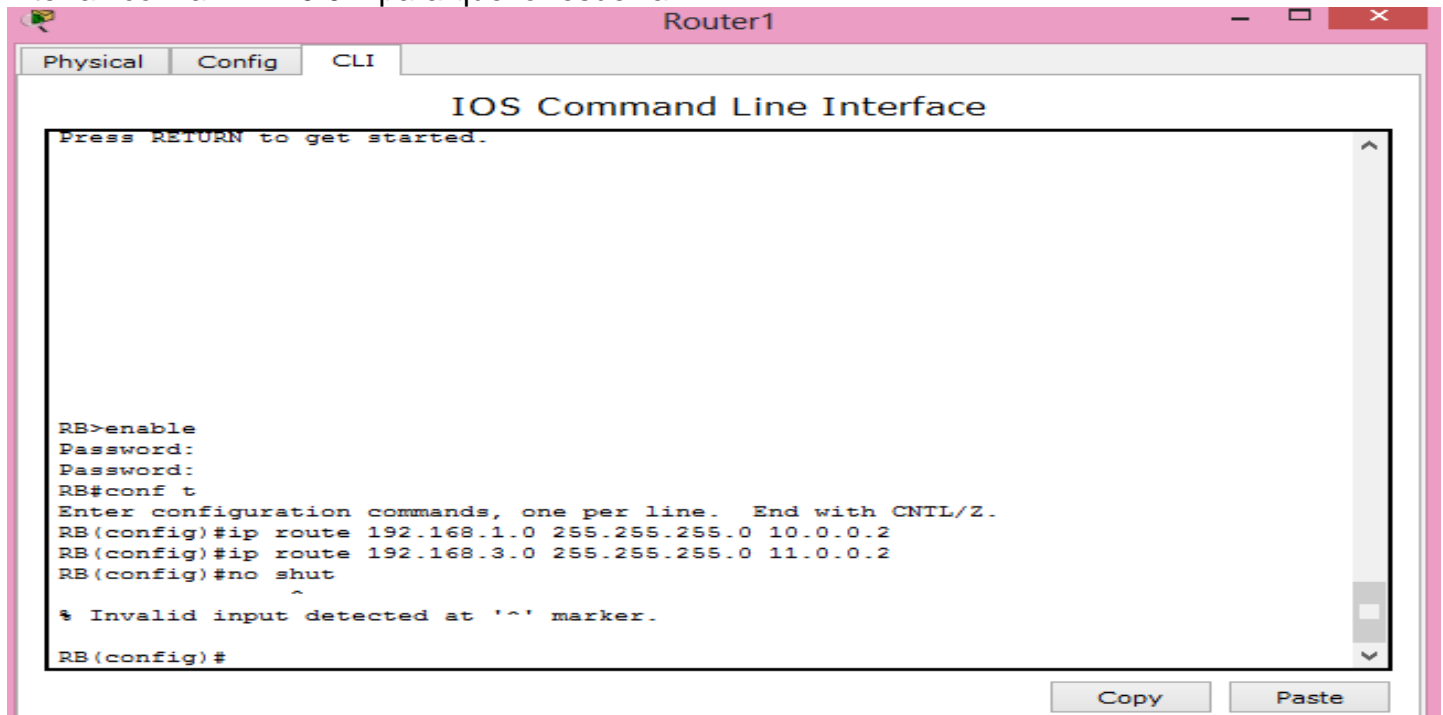
Con las rutas estáticas le estamos diciendo al RouterA que todo tráfico hacia la red 192.168.2.0 y 192.168.3.0 se debe enviar hacia la interfaz con la IP 10.0.0.1 para que lo resuelva.

RouterB

```
RouterB>enable
RouterB#config terminal
RouterB(config)#ip route 192.168.1.0 255.255.255.0 10.0.0.2

RouterB(config)#ip route 192.168.3.0 255.255.255.0 11.0.0.2
```

Con la primer ruta estática le estamos diciendo al RouterB que todo tráfico hacia la red 192.168.1.0 se debe enviar hacia la interfaz con la IP 10.0.0.2 para que lo resuelva. Con la segunda ruta estática le estamos diciendo al RouterB que todo tráfico hacia la red 192.168.3.0 se debe enviar hacia la interfaz con la IP 11.0.0.2 para que lo resuelva.



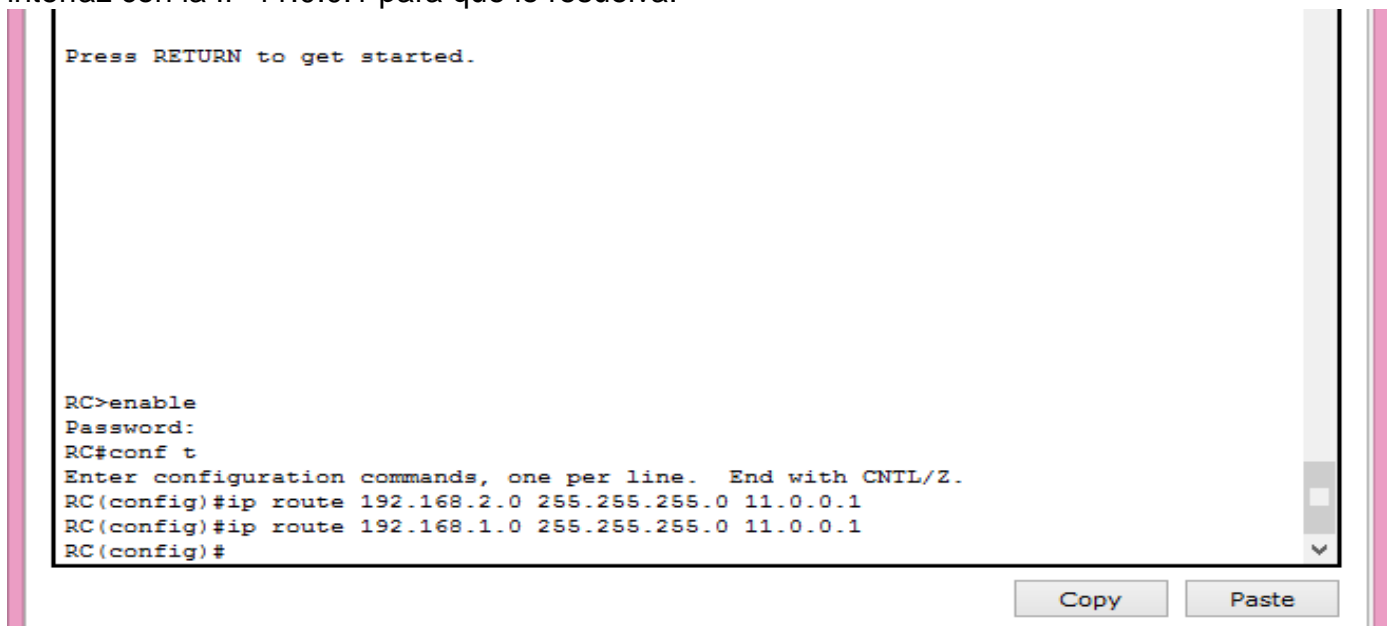
```
Router1
Physical Config CLI
IOS Command Line Interface
Press RETURN to get started.

RB>enable
Password:
Password:
RB#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RB(config)#ip route 192.168.1.0 255.255.255.0 10.0.0.2
RB(config)#ip route 192.168.3.0 255.255.255.0 11.0.0.2
RB(config)#no shut
^
% Invalid input detected at '^' marker.
RB(config)#
```

RouterC

```
RouterC>enable
RouterC#config terminal
RouterC(config)#ip route 192.168.2.0 255.255.255.0 11.0.0.1
RouterC(config)#ip route 192.168.1.0 255.255.255.0 11.0.0.1
```

Con la primer ruta estática le estamos diciendo al RouterC que todo tráfico hacia la red 192.168.2.0 se debe enviar hacia la interfaz con la IP 11.0.0.1 para que lo resuelva. Con la segunda ruta estática le estamos diciendo al RouterC que todo tráfico hacia la red 192.168.1.0 se debe enviar hacia la interfaz con la IP 11.0.0.1 para que lo resuelva.



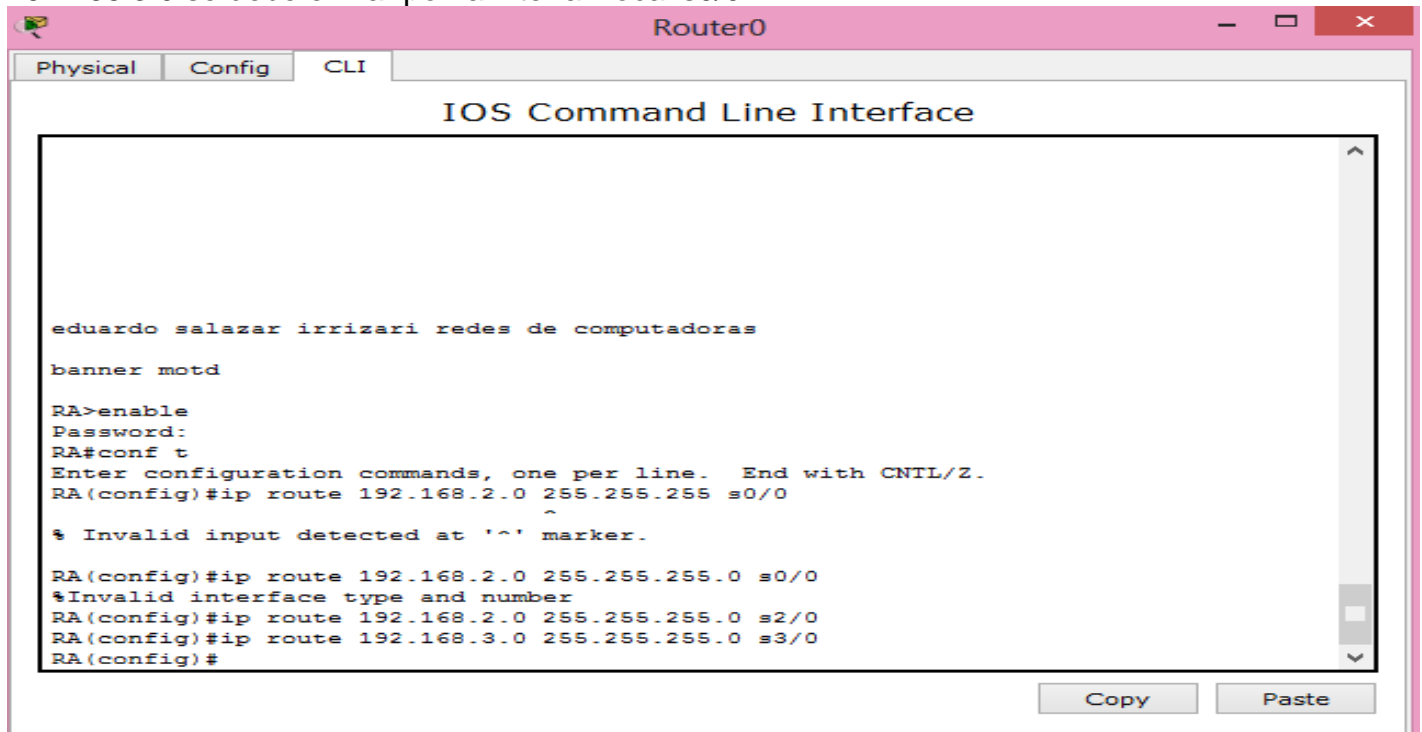
```
Press RETURN to get started.

RC>enable
Password:
RC#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RC(config)#ip route 192.168.2.0 255.255.255.0 11.0.0.1
RC(config)#ip route 192.168.1.0 255.255.255.0 11.0.0.1
RC(config)#
```


B) Configurar Rutas Estáticas Utilizando la “Interfaz de Salida” Router A

```
RouterA>enable
RouterA#config terminal
RouterA(config)#ip route 192.168.2.0 255.255.255.0 s0/0
RouterA(config)#ip route 192.168.3.0 255.255.255.0 s0/0
```

Con estas rutas estáticas le estamos diciendo al RouterA que todo tráfico hacia la red 192.168.2.0 y 192.168.3.0 se debe enviar por la interfaz local s0/0.



The screenshot shows the CLI interface of Router0. The window title is "Router0". The tabs are "Physical", "Config", and "CLI". The main content area displays the following text:

```
IOS Command Line Interface

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RA>enable
Password:
RA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RA(config)#ip route 192.168.2.0 255.255.255.0 s0/0
^
% Invalid input detected at '^' marker.

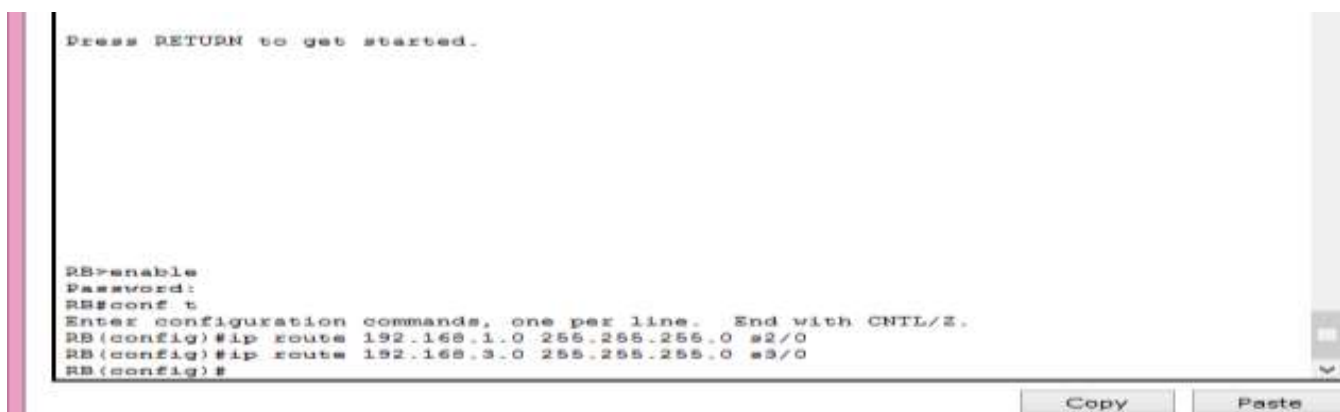
RA(config)#ip route 192.168.2.0 255.255.255.0 s0/0
%Invalid interface type and number
RA(config)#ip route 192.168.2.0 255.255.255.0 s2/0
RA(config)#ip route 192.168.3.0 255.255.255.0 s3/0
RA(config)#
```

At the bottom right, there are "Copy" and "Paste" buttons.

RouterB

```
RouterB>enable
RouterB#config terminal
RouterB(config)#ip route 192.168.1.0 255.255.255.0 s0/0
RouterB(config)#ip route 192.168.3.0 255.255.255.0 s0/1
```

Con la primer ruta estática le estamos diciendo al RouterB que todo tráfico hacia la red 192.168.1.0 se debe enviar por la interfaz local s0/0. Con la segunda ruta estática le estamos diciendo al RouterB que todo tráfico hacia la red 192.168.3.0 se debe enviar por la interfaz local s0/1.



The screenshot shows the CLI interface of RouterB. The window title is "RouterB". The main content area displays the following text:

```
Press RETURN to get started.

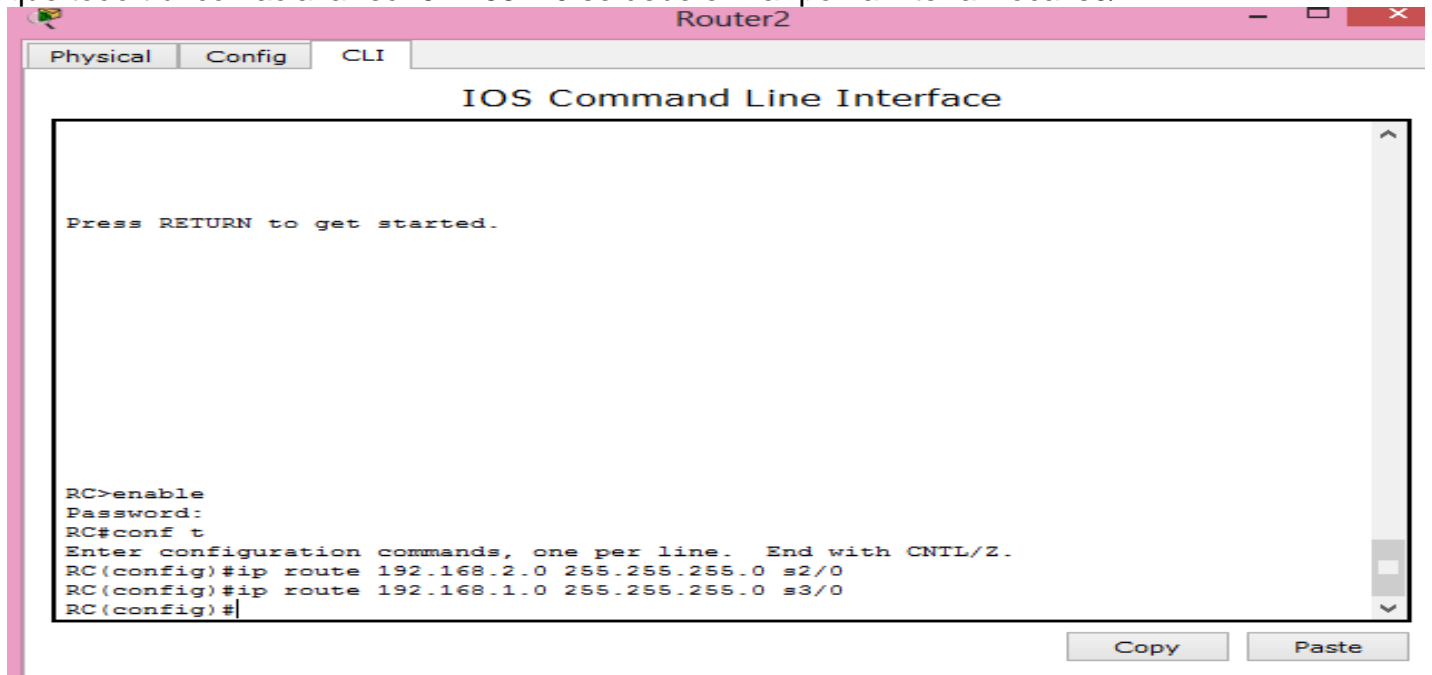
RB>enable
Password:
RB#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RB(config)#ip route 192.168.1.0 255.255.255.0 s2/0
RB(config)#ip route 192.168.3.0 255.255.255.0 s3/0
RB(config)#
```

At the bottom right, there are "Copy" and "Paste" buttons.

RouterC

```
RouterC>enable
RouterC#config terminal
RouterC(config)#ip route 192.168.2.0 255.255.255.0 s0/1
RouterC(config)#ip route 192.168.1.0 255.255.255.0 s0/1
```

Con la primer ruta estática le estamos diciendo al RouterC que todo tráfico hacia la red 192.168.2.0 se debe enviar por la interfaz local s0/1. Con la segunda ruta estática le estamos diciendo al RouterC que todo tráfico hacia la red 192.168.1.0 se debe enviar por la interfaz local s0/1.



PASO 5

Comprobación de Rutas Estáticas usando la IP del Siguiete Salto

El comando "show ip route" muestra la tabla de enrutamiento del dispositivo.

Las rutas marcadas con "c" pertenecen a las redes directamente conectadas y las marcadas con "s" son las rutas estáticas configuradas.

RA

```
Router0
Physical Config CLI
IOS Command Line Interface

eduardo salazar lexisari redes de computadoras
banner motd
RA>enable
Password:
RA#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
I - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, Serial2/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
S    192.168.2.0/24 [1/0] via 10.0.0.1
S    192.168.3.0/24 is directly connected, Serial2/0
RA#
```

RB.

```
Router1
Physical Config CLI
IOS Command Line Interface

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

Gateway of last resort is not set

C    10.0.0.0/8 is directly connected, Serial2/0
C    11.0.0.0/8 is directly connected, Serial3/0
S    192.168.1.0/24 [1/0] via 10.0.0.2
S    192.168.2.0/24 is directly connected, Serial2/0
C    192.168.2.0/24 is directly connected, FastEthernet0/0
S    192.168.3.0/24 [1/0] via 11.0.0.2
S    192.168.4.0/24 is directly connected, Serial3/0
RB#
```

RC.

IOS Command Line Interface

```
Password:
RC#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RC(config)#ip route 192.168.2.0 255.255.255.0 s2/0
RC(config)#ip route 192.168.1.0 255.255.255.0 s3/0
RC(config)#exit
RC#
%SYS-5-CONFIG_I: Configured from console by console

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

Gateway of last resort is not set

C    11.0.0.0/8 is directly connected, Serial2/0
S    192.168.1.0/24 [1/0] via 11.0.0.1
S    192.168.2.0/24 [1/0] via 11.0.0.1
                                     is directly connected, Serial2/0
C    192.168.3.0/24 is directly connected, FastEthernet0/0
RC#
```

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Conclusion

Los conocimientos que se obtubieron durante la realizacion de esta practica fue la de interconectar 3 routers, con sus respectivos switchs y estos conectados a computadoras, a las cuales se les asigno una direccion IP y se levantaron los fasteternet de los ruoters, asi como sus respectivos seriales registrados en una tabla de direccionamiento antes mencionadas. El objetivo fue de intercnectar 3 routers los cuales uno deberia de registrar los puertos seriales de los dos siguientes.