



Instituto Tecnológico de Salina Cruz

Fundamentos de Redes

Semestre Enero – Julio 2015

Reporte de Practica

Practica nº 3

Unidad 5

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Fecha: 27 de Mayo del 2015

Objetivos:

- Conectar una red de acuerdo con el Diagrama de topología.
- Eliminar la configuración de inicio y recargar un router al estado por defecto.
- Realizar tareas de configuración básicas en un router.
- Determinar rutas de nivel 1 y nivel 2.
- Modificar la configuración para reflejar el enrutamiento estático y el enrutamiento predeterminado.
- Habilitar el enrutamiento con clase e investigar su comportamiento.
- Habilitar el enrutamiento sin clase e investigar su comportamiento.

Instrucciones:

- 1.- Realizar la tabla de ruteo.
- 2.- Realizar configuraciones iniciales.
- 3.- Identificar comandos a utilizar.

Materiales:

- Computadoras.
- Cisco Packet Tracer.
- Silla.

Escenario:

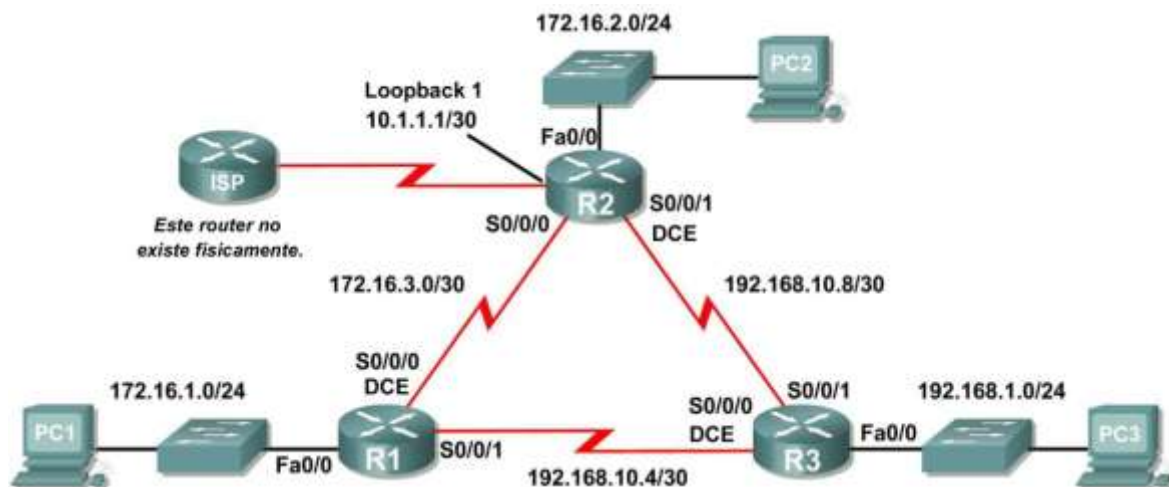
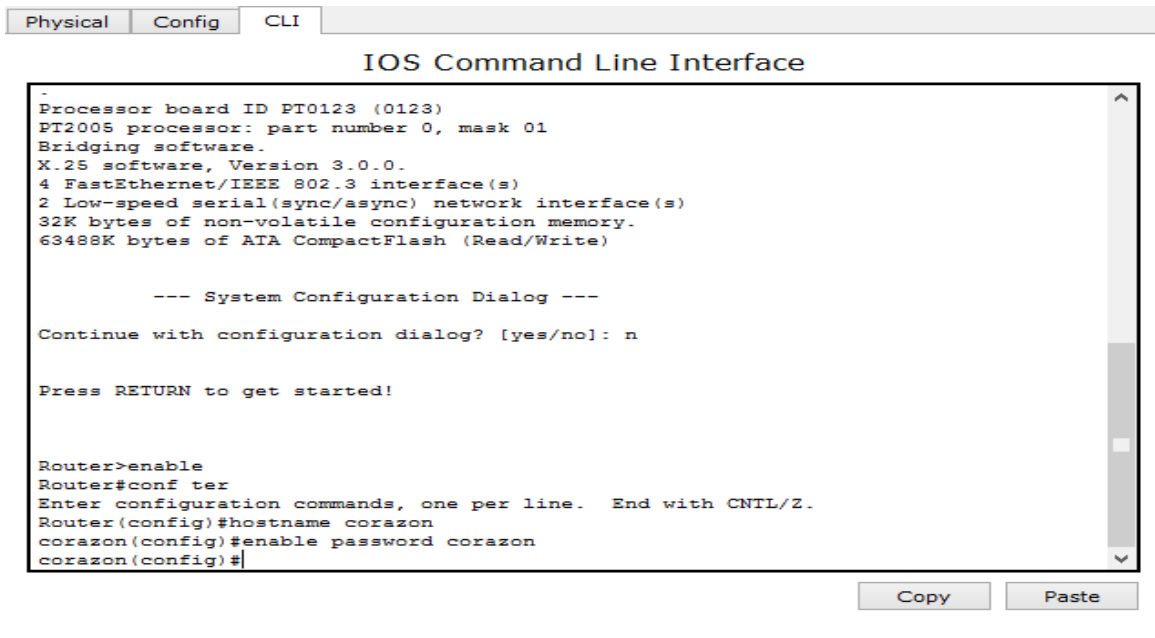


Tabla de enrutamiento

Dispositivo	Interfaz	Dirección IP	Máscara de subred	Gateway por defecto
R1	Fa0/0	172.16.1.1	255.255.255.0	No aplicable
	S0/0/0	172.16.3.1	255.255.255.252	No aplicable
	S0/0/1	192.168.10.5	255.255.255.252	No aplicable
R2	Fa0/0	172.16.2.1	255.255.255.0	No aplicable
	S0/0/0	172.16.3.2	255.255.255.252	No aplicable
	S0/0/1	192.168.10.9	255.255.255.252	No aplicable
	Lo1	10.1.1.1	255.255.255.252	No aplicable
R3	Fa0/0	192.168.1.1	255.255.255.0	No aplicable
	S0/0/0	192.168.10.6	255.255.255.252	No aplicable
	S0/0/1	192.168.10.10	255.255.255.252	No aplicable
PC1	NIC	172.16.1.10	255.255.255.0	172.16.1.1
PC2	NIC	172.16.2.10	255.255.255.0	172.16.2.1
PC3	NIC	192.168.1.10	255.255.255.0	192.168.1.1

Como primer paso se configuraran los routers de la siguiente manera, asignandoles a cada uno un nombre y una contraseña, seguidos de la colocacion de un banner de bienvenida.

Router 1 (nombre: corazon, contraseña:corazon)



The screenshot shows the IOS Command Line Interface with tabs for Physical, Config, and CLI. The main window displays the following text:

```
-
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)

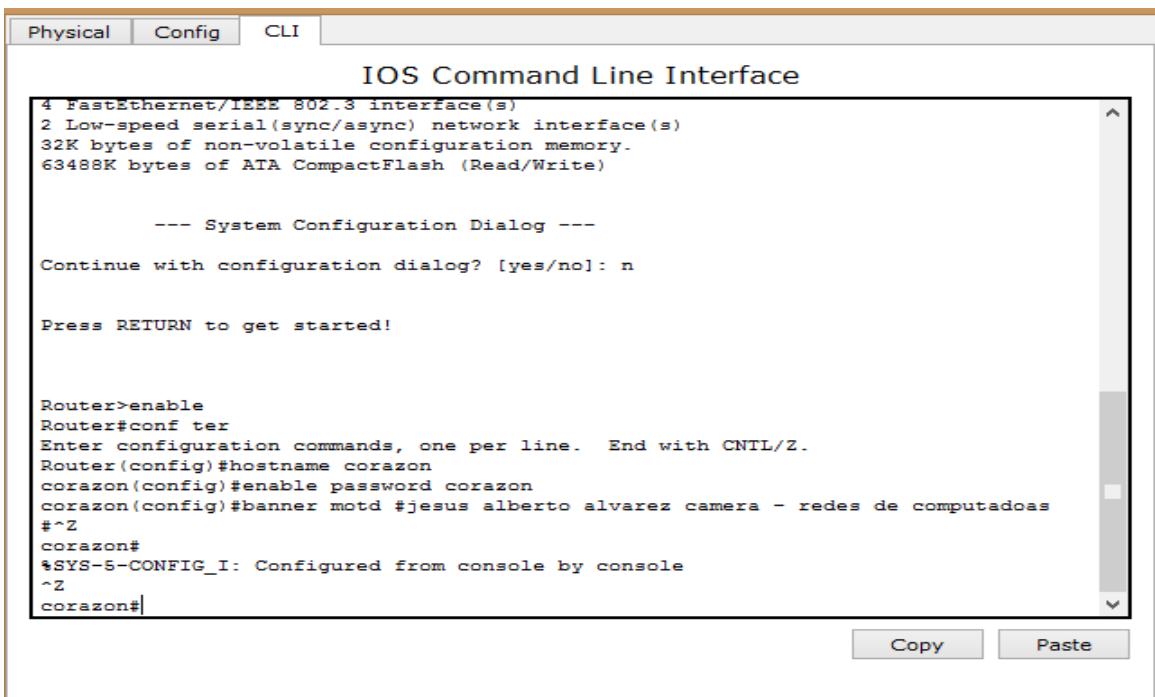
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname corazon
corazon(config)#enable password corazon
corazon(config)#
```

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

Asignación del banner.



The screenshot shows the IOS Command Line Interface with tabs for Physical, Config, and CLI. The main window displays the following text:

```
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)

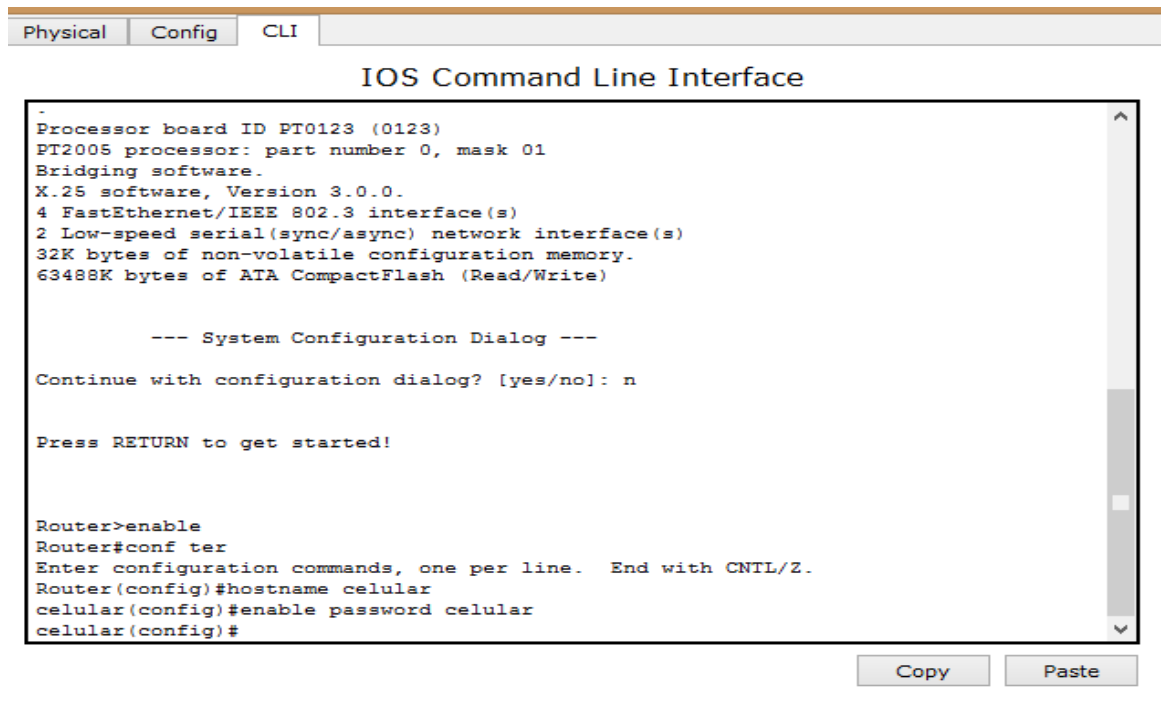
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname corazon
corazon(config)#enable password corazon
corazon(config)#banner motd #jesus alberto alvarez camera - redes de computadoas
#^Z
corazon#
%SYS-5-CONFIG_I: Configured from console by console
^Z
corazon#
```

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

Router 2 (nombre: celular, contraseña:celular)



Physical Config CLI

IOS Command Line Interface

```
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 ---

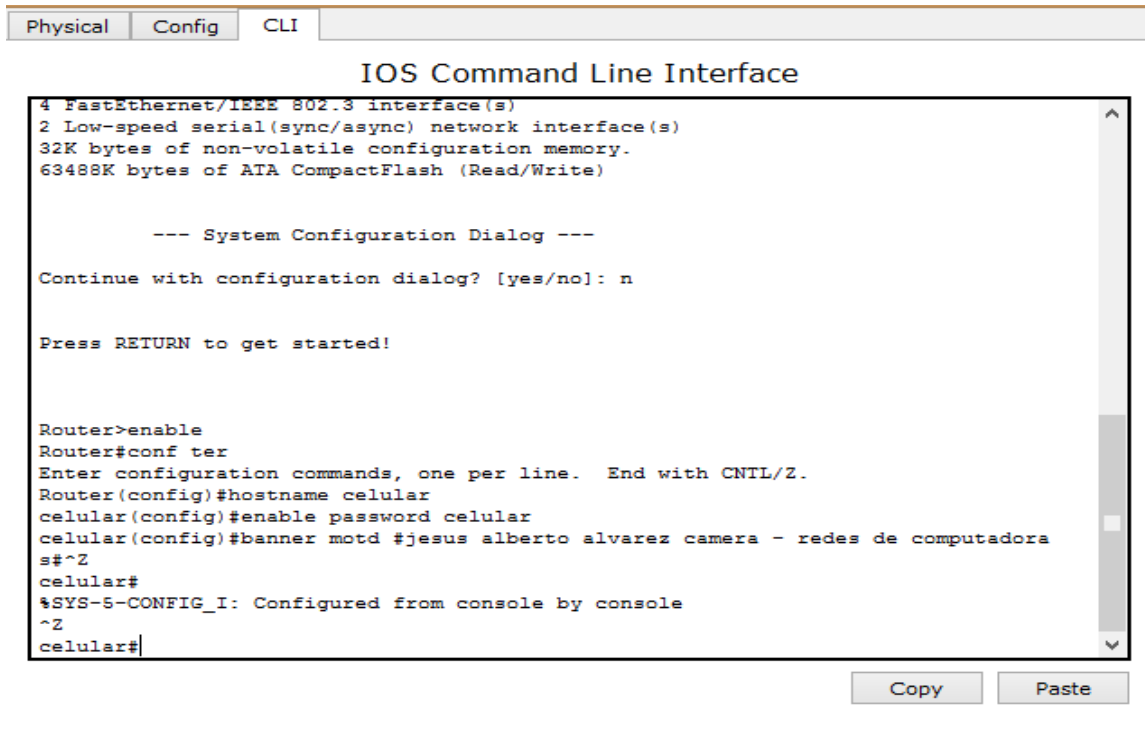
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname celular
celular(config)#enable password celular
celular(config)#
```

Copy Paste

Asignación del banner.



Physical Config CLI

IOS Command Line Interface

```
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 ---

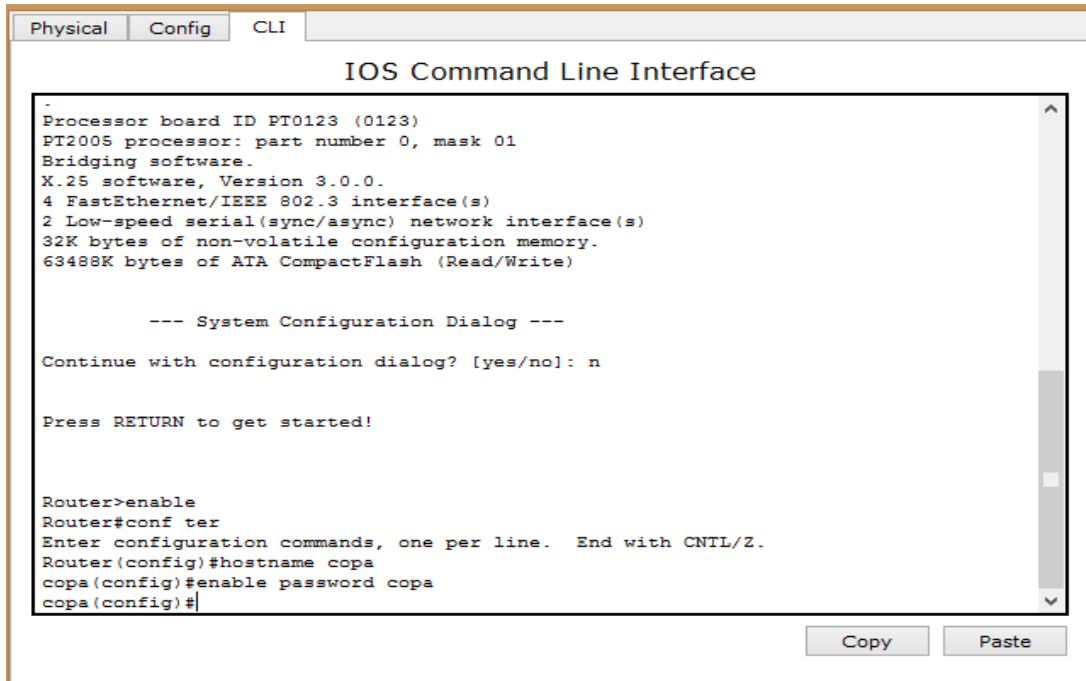
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname celular
celular(config)#enable password celular
celular(config)#banner motd #jesus alberto alvarez camera - redes de computadora
s#^Z
celular#
%SYS-5-CONFIG_I: Configured from console by console
^Z
celular#
```

Copy Paste

Router 3 (nombre: copa, contraseña:copa)



```
Physical Config CLI
IOS Command Line Interface
-
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)

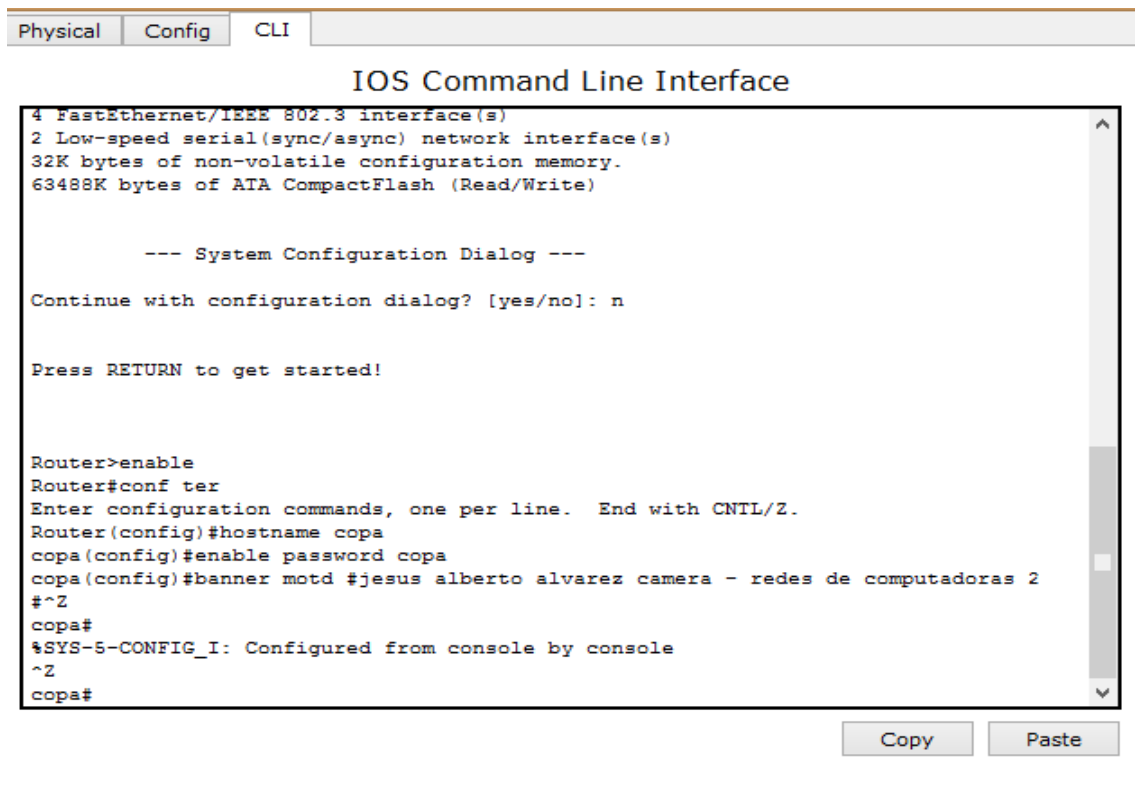
--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable
Router#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname copa
copa(config)#enable password copa
copa(config)#
```

Copy Paste

Asignación del banner.



```
Physical Config CLI
IOS Command Line Interface
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#conf ter
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname copa
copa(config)#enable password copa
copa(config)#banner motd #jesus alberto alvarez camera - redes de computadoras 2
#^Z
copa#
%SYS-5-CONFIG_I: Configured from console by console
^Z
copa#
```

Copy Paste

A continuación se procede a levantar los puertos seriales y los fastethernet de los Routers de la siguiente manera

Router 1

Puerto fastethernet 0/0

```
Physical | Config | CLI | IOS Command Line Interface

banner motd

xavi>enable
Password:
Password:
xavi#conf t
Enter configuration commands, one per line. End with CNTL/Z.
xavi(config)#interface fa0/0
xavi(config-if)#ip address 172.16.1.1 255.255.0.0
xavi(config-if)#no shut

xavi(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

xavi(config-if)#
```

Copy Paste

Serial 2/0

```
Physical | Config | CLI | IOS Command Line Interface

Enter configuration commands, one per line. End with CNTL/Z.
xavi(config)#interface fa0/0
xavi(config-if)#ip address 172.16.1.1 255.255.0.0
xavi(config-if)#no shut

xavi(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

xavi(config-if)#exit
xavi(config)#interface s2
^
% Invalid input detected at '^' marker.

xavi(config)#interface s2/0
xavi(config-if)#ip address 172.16.3.1 255.255.0.0
% 172.16.0.0 overlaps with FastEthernet0/0
xavi(config-if)#ip address 172.16.3.1 255.255.255.0
% 172.16.3.0 overlaps with FastEthernet0/0
xavi(config-if)#ip address 172.168.3.1 255.255.0.0
xavi(config-if)#no shut

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

Copy Paste

Serial 3/0.

```
Physical Config CLI
IOS Command Line Interface
o up
Xavi(config-if)#exiy
^
% Invalid input detected at '^' marker.
Xavi(config-if)#exit
Xavi(config)#interface s2/0
Xavi(config-if)#ip address 172.168.3.1 255.255.0.0
Xavi(config-if)#no shut
Xavi(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
Xavi(config-if)#exit
Xavi(config)#interface s3/0
Xavi(config-if)#ip addre
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Xavi(config-if)#interface s3/0
Xavi(config-if)#ip address 192.16.10.5 255.255.255.0
Xavi(config-if)#no shut
Xavi(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
Xavi(config-if)#
```

Copy Paste

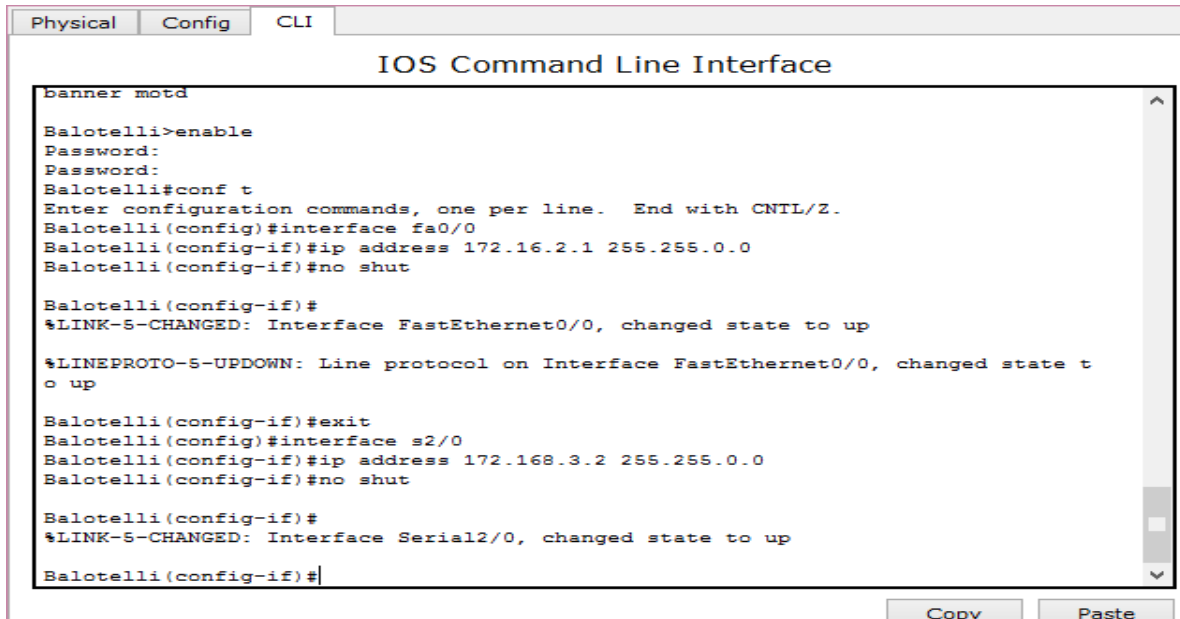
Router 2.

Puerto fastethernet0/0

```
Physical Config CLI
IOS Command Line Interface
banner motd
Balotelli>enable
Password:
Password:
Balotelli#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Balotelli(config)#interface fa0/0
Balotelli(config-if)#ip address 172.16.2.1 255.255.0.0
Balotelli(config-if)#no shut
Balotelli(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state t
o up
Balotelli(config-if)#
```

Copy Paste

Serial 2/0



The screenshot shows the IOS Command Line Interface with tabs for Physical, Config, and CLI. The terminal output displays the following commands and system messages:

```
banner motd
Balotelli>enable
Password:
Password:
Balotelli#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Balotelli(config)#interface fa0/0
Balotelli(config-if)#ip address 172.16.2.1 255.255.0.0
Balotelli(config-if)#no shut

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

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

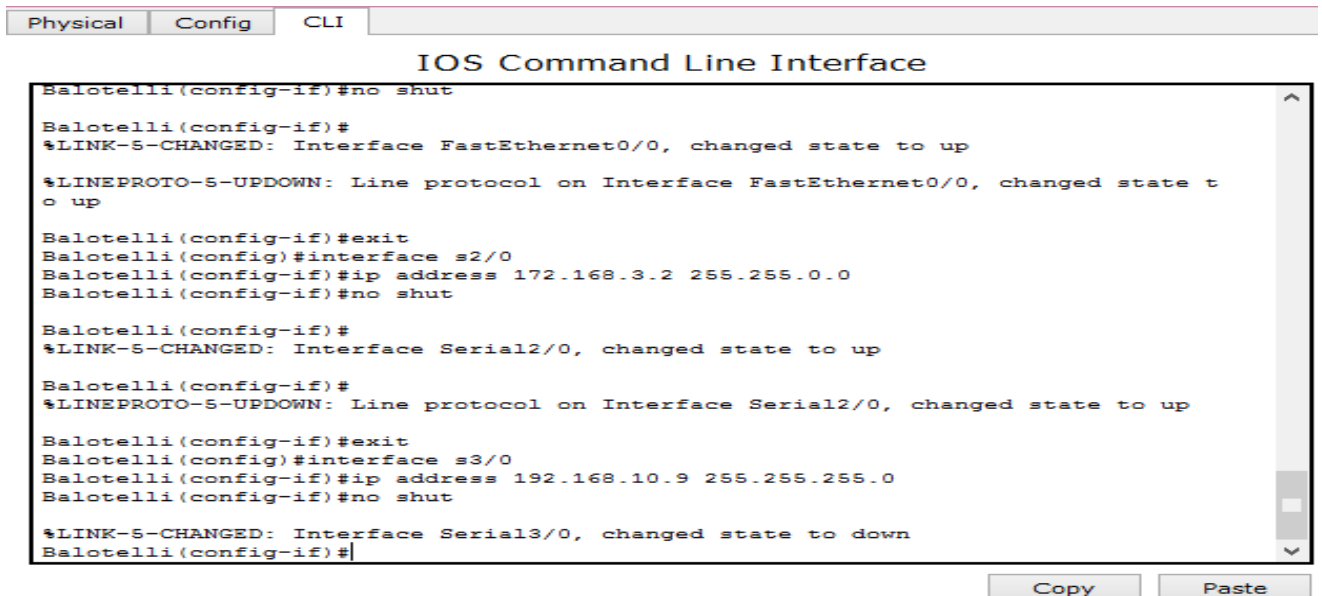
Balotelli(config-if)#exit
Balotelli(config)#interface s2/0
Balotelli(config-if)#ip address 172.168.3.2 255.255.0.0
Balotelli(config-if)#no shut

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

Balotelli(config-if)#
```

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

Serial 3/0



The screenshot shows the IOS Command Line Interface with tabs for Physical, Config, and CLI. The terminal output displays the following commands and system messages:

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

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

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

Balotelli(config-if)#exit
Balotelli(config)#interface s2/0
Balotelli(config-if)#ip address 172.168.3.2 255.255.0.0
Balotelli(config-if)#no shut

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

Balotelli(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Balotelli(config-if)#exit
Balotelli(config)#interface s3/0
Balotelli(config-if)#ip address 192.168.10.9 255.255.255.0
Balotelli(config-if)#no shut

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

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

Router 3

Puerto fastethernet0/0

```
Physical Config CLI
IOS Command Line Interface

Puyol>enable
Password:
Puyol#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Puyol(config)#interface fa0/0
Puyol(config-if)#ip address 192.168.1.1 255.255.255.0
Puyol(config-if)#no shut

Puyol(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
Puyol(config-if)#
```

Copy Paste

Serial 2/0

```
Physical Config CLI
IOS Command Line Interface

banner motd
Puyol>enable
Password:
Puyol#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Puyol(config)#interface fa0/0
Puyol(config-if)#ip address 192.168.1.1 255.255.255.0
Puyol(config-if)#no shut

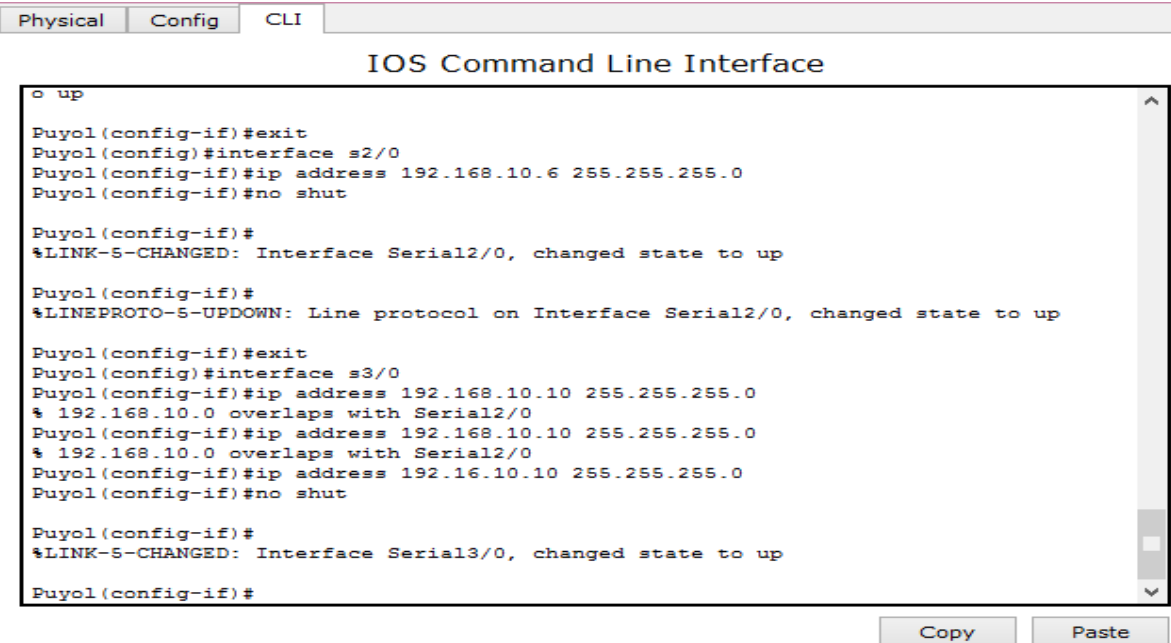
Puyol(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Puyol(config-if)#exit
Puyol(config)#interface s2/0
Puyol(config-if)#ip address 192.168.10.6 255.255.255.0
Puyol(config-if)#no shut

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

Copy Paste

Serial 3/0.



The screenshot shows the IOS Command Line Interface with tabs for Physical, Config, and CLI. The terminal output displays the configuration process for Serial2/0 and Serial3/0. For Serial2/0, the IP address 192.168.10.6 is assigned, and the interface is brought up. For Serial3/0, the IP address 192.16.10.10 is assigned, and the interface is also brought up. The terminal shows messages for link changes and line protocol status.

```
o up
Puyol(config-if)#exit
Puyol(config)#interface s2/0
Puyol(config-if)#ip address 192.168.10.6 255.255.255.0
Puyol(config-if)#no shut

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

Puyol(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Puyol(config-if)#exit
Puyol(config)#interface s3/0
Puyol(config-if)#ip address 192.168.10.10 255.255.255.0
% 192.168.10.0 overlaps with Serial2/0
Puyol(config-if)#ip address 192.168.10.10 255.255.255.0
% 192.168.10.0 overlaps with Serial2/0
Puyol(config-if)#ip address 192.16.10.10 255.255.255.0
Puyol(config-if)#no shut

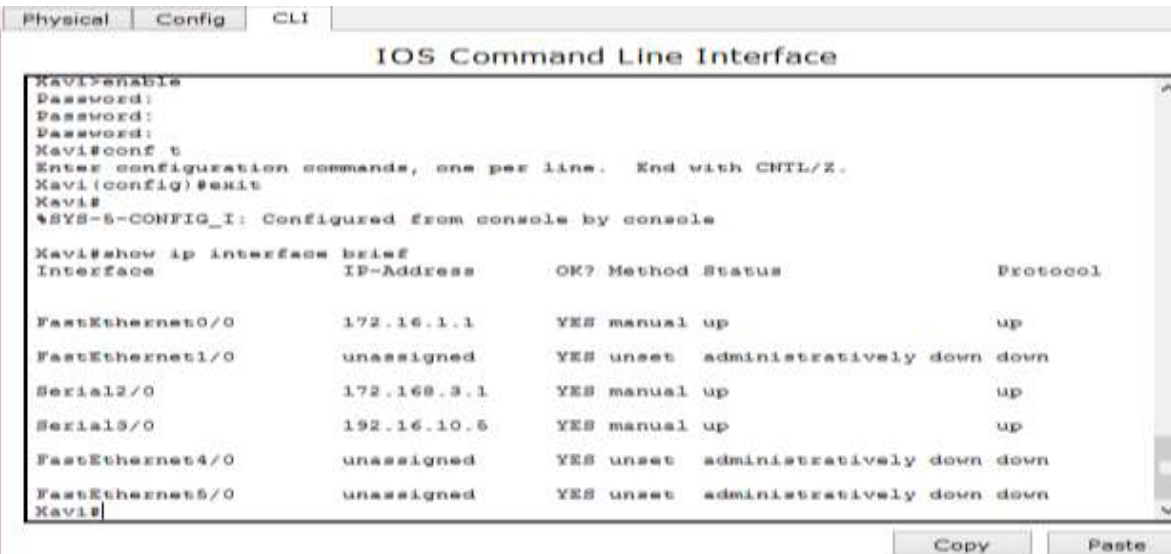
Puyol(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up

Puyol(config-if)#
```

Copy Paste

Como siguiente paso se procede a Verificar el direccionamiento IP y las interfaces de la siguiente manera.

Router 1



The screenshot shows the IOS Command Line Interface with tabs for Physical, Config, and CLI. The terminal output displays the output of the 'show ip interface brief' command, showing the status of various interfaces. The output is as follows:

```
Kavi>enable
Password:
Password:
Kavi#conf t
Enter configuration commands, one per line. End with CRTL/Z.
Kavi(config)#exit
Kavi#
%SYS-6-CONFIG_I: Configured from console by console

Kavi#show ip interface brief
Interface                IP-Address      OK? Method Status        Protocol

FastEthernet0/0          172.16.1.1      YES manual up             up
FastEthernet1/0          unassigned      YES unset  administratively down down
Serial2/0                 172.168.3.1    YES manual up             up
Serial3/0                 192.16.10.5    YES manual up             up
FastEthernet4/0          unassigned      YES unset  administratively down down
FastEthernet5/0          unassigned      YES unset  administratively down down
Kavi#
```

Copy Paste

Router 2

Physical Config CLI

IOS Command Line Interface

```
Balotelli>enable
Password:
Balotelli#show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          172.16.2.1      YES manual  up          up
FastEthernet1/0          unassigned      YES unset   administratively down down
Serial2/0                 172.168.3.2     YES manual  up          up
Serial3/0                 192.168.10.9    YES manual  up          up
FastEthernet4/0          unassigned      YES unset   administratively down down
FastEthernet5/0          unassigned      YES unset   administratively down down
Balotelli#
```

Copy Paste

R3.

Physical Config CLI

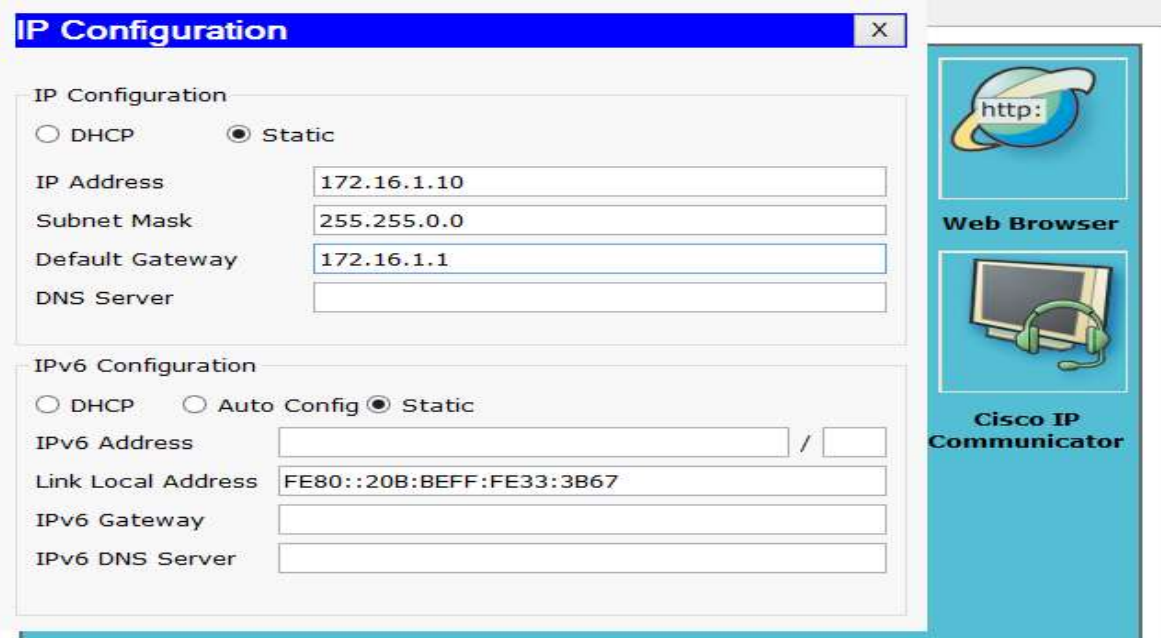
IOS Command Line Interface

```
Puyol>enable
Password:
Puyol#show ip interface brief
Interface                IP-Address      OK? Method Status      Protocol
FastEthernet0/0          192.168.1.1     YES manual  up          up
FastEthernet1/0          unassigned      YES unset   administratively down down
Serial2/0                 192.168.10.6    YES manual  up          up
Serial3/0                 192.16.10.10    YES manual  up          up
FastEthernet4/0          unassigned      YES unset   administratively down down
FastEthernet5/0          unassigned      YES unset   administratively down down
Puyol#
```

Copy Paste

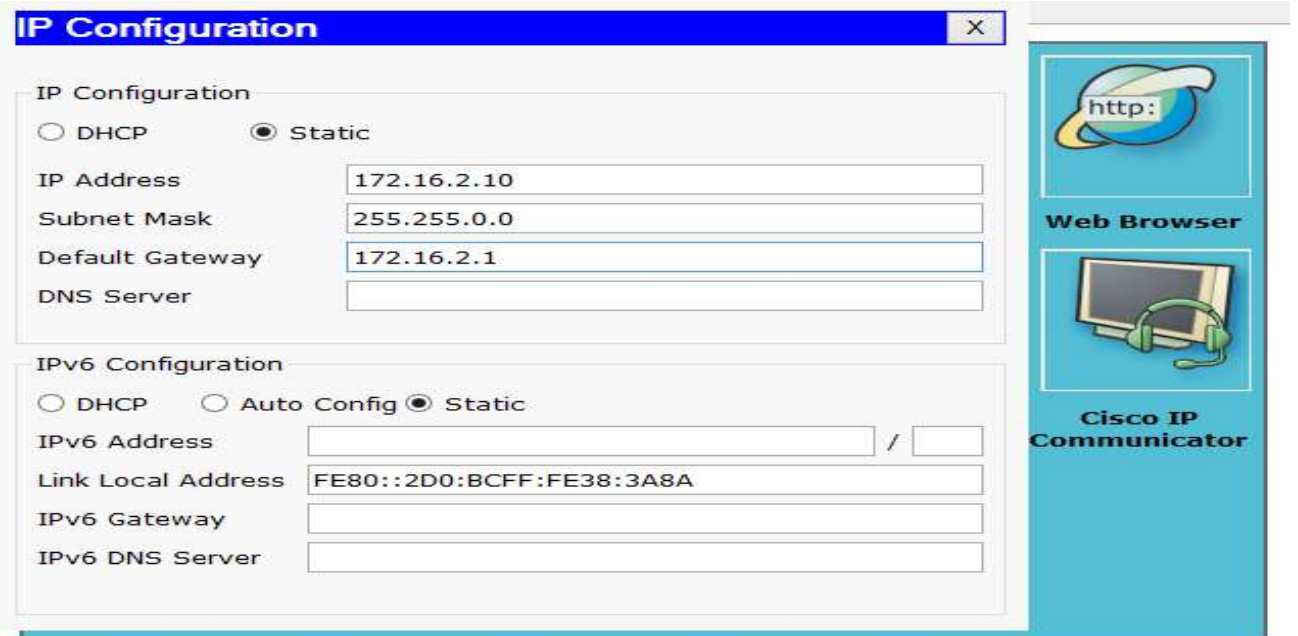
Como siguiente paso se procede a configurar las direcciones IP y las máscaras de subred para cada una de las pcs.

Pc1



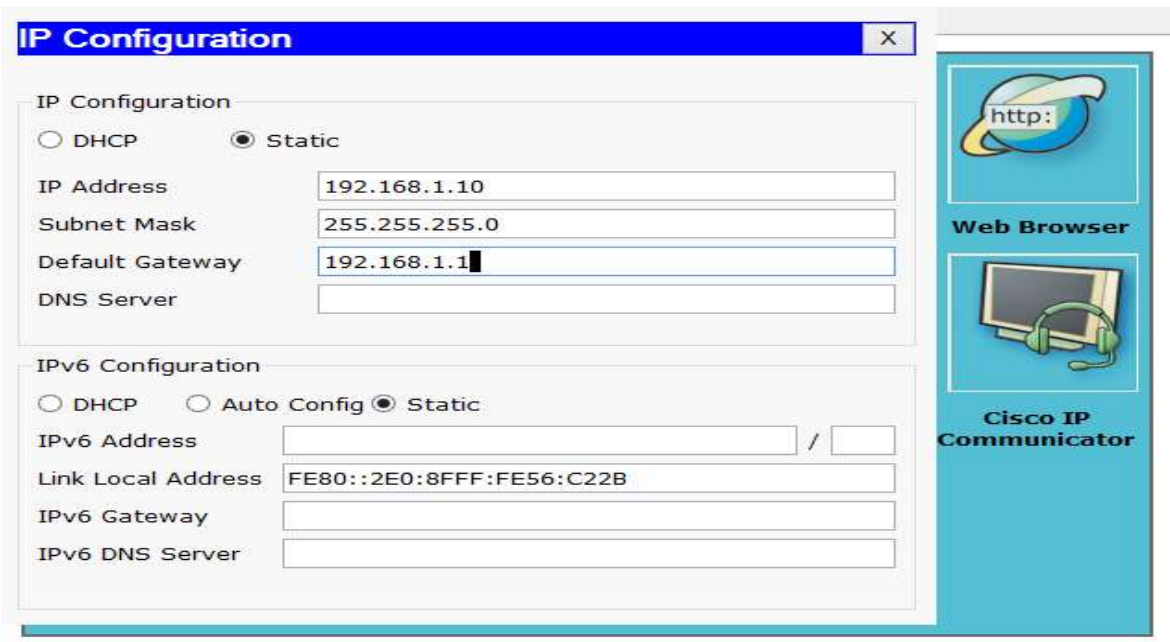
The screenshot shows the 'IP Configuration' window for Pc1. It is divided into two main sections: 'IP Configuration' and 'IPv6 Configuration'. In the 'IP Configuration' section, the 'Static' radio button is selected. The fields are filled with: IP Address: 172.16.1.10, Subnet Mask: 255.255.0.0, Default Gateway: 172.16.1.1, and DNS Server: (empty). In the 'IPv6 Configuration' section, the 'Static' radio button is selected. The fields are: IPv6 Address: (empty), Link Local Address: FE80::20B:BEFF:FE33:3B67, IPv6 Gateway: (empty), and IPv6 DNS Server: (empty). On the right side of the window, there are two icons: 'Web Browser' with an 'http:' icon and 'Cisco IP Communicator' with a headset icon.

Pc2.

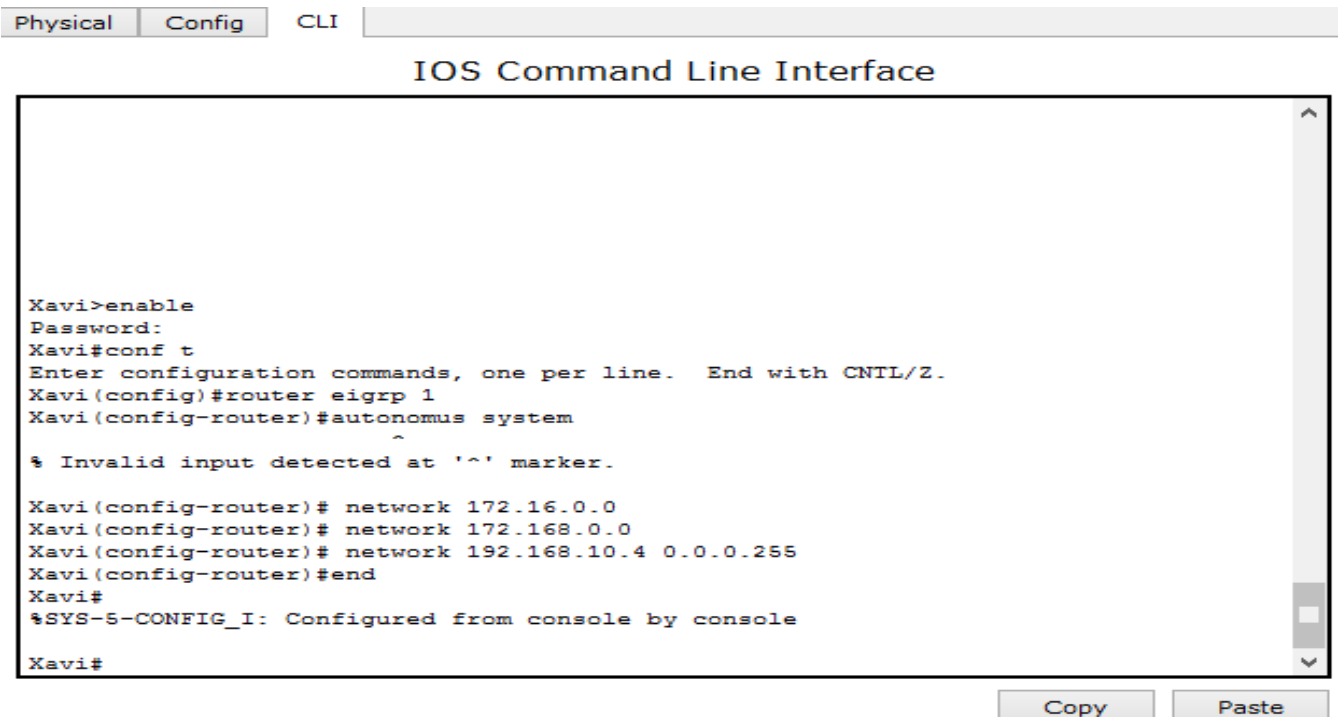


The screenshot shows the 'IP Configuration' window for Pc2. It is divided into two main sections: 'IP Configuration' and 'IPv6 Configuration'. In the 'IP Configuration' section, the 'Static' radio button is selected. The fields are filled with: IP Address: 172.16.2.10, Subnet Mask: 255.255.0.0, Default Gateway: 172.16.2.1, and DNS Server: (empty). In the 'IPv6 Configuration' section, the 'Static' radio button is selected. The fields are: IPv6 Address: (empty), Link Local Address: FE80::2D0:BCFF:FE38:3A8A, IPv6 Gateway: (empty), and IPv6 DNS Server: (empty). On the right side of the window, there are two icons: 'Web Browser' with an 'http:' icon and 'Cisco IP Communicator' with a headset icon.

Pc3.



Como siguiente paso se procede a Configurar EIGRP en el router 1 de la siguiente manera.



Como siguiente punto se Habilita el enrutamiento EIGRP en el router 2 con el comando router EIGRP de la siguiente manera

```
Physical | Config | CLI | IOS Command Line Interface

Balotelli>enable
Password:
Balotelli#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Balotelli(config)#router eigrp 1
Balotelli(config-router)#network 172.16.0.0
Balotelli(config-router)#network 192.168.10.8 0.0.0.255
Balotelli(config-router)#end
Balotelli#
%SYS-5-CONFIG_I: Configured from console by console
Balotelli#
```

Copy Paste

A continuación se Habilita el enrutamiento EIGRP en el router 3 con el comando router EIGRP de la siguiente forma.

```
Physical | Config | CLI | IOS Command Line Interface

Puyol>enable
Password:
Puyol#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Puyol(config)#router eigrp 1
Puyol(config-router)#network 192.168.1.0
Puyol(config-router)#network 192.168.10.4 0.0.0.255
Puyol(config-router)#network 192.168.10.8 0.0.0.255
Puyol(config-router)#end
Puyol#
%SYS-5-CONFIG_I: Configured from console by console
Puyol#
```

Copy Paste

A continuación se Verifican las operaciones de EIGRP.

En el router R1 utilice el comando show ip eigrp neighbors para ver la tabla de vecinos y verificar que EIGRP haya establecido una adyacencia con los routers R2 y R3.

¿Cuál es la dirección IP del router EIGRP vecino?

172.16.3.1

¿Qué interfaz del router R2 es el vecino adyacente?

Serial2/0

```
Kavi>enable
Password:
Kavi#show ip eigrp neighbors
IP-EIGRP neighbors for process 1

Kavi#
Kavi#show ip protocols

Routing Protocol is "eigrp 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Default networks flagged in outgoing updates
  Default networks accepted from incoming updates
  EIGRP metric weight K1=1, K2=0, K3=1, K4=0, K5=0
  EIGRP maximum hopcount 100
  EIGRP maximum metric variance 1
  Redistributing: eigrp 1
    Automatic network summarization is in effect
  Automatic address summarization:
  Maximum path: 4
  Routing for Networks:
    172.16.0.0
    172.168.0.0
    192.168.10.0
  Routing Information Sources:
    Gateway         Distance         Last Update
  Distance: internal 90 external 170

Kavi#
```

Como siguiente punto se Visualiza la tabla de enrutamiento en el router 1

```
Kavi#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    172.16.0.0/16 is directly connected, FastEthernet0/0
C    172.168.0.0/16 is directly connected, Serial2/0
C    192.16.10.0/24 is directly connected. Serial3/0
```

A continuación Visualice la tabla de enrutamiento en el router 3.

```
Physical Config CLI
IOS Command Line Interface

Puyol>enable
Password:
Puyol#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    192.16.10.0/24 is directly connected, Serial3/0
C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.10.0/24 is directly connected, Serial2/0
```

Como siguiente punto Visualice la información métrica de EIGRP.

```
Xavi>enable
Password:
Xavi#show interface serial2/0
Serial2/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 172.168.3.1/16
MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 96 kilobits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 104 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
343 packets output, 20580 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
0 carrier transitions
DCD=up DSR=up DTR=up RTS=up CTS=up
Xavi#
```

Como siguiente punto modifique el ancho de banda de las interfaces seriales de todos los Routers.

Router 1

```
Xavi>enable
Password:
Xavi#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Xavi(config)#interface serial2/0
Xavi(config-if)#bandwidth
% Incomplete command.
Xavi(config-if)#bandwidth 64
Xavi(config-if)#
```

Router 2

```
Balotelli>enable
Password:
Balotelli#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Balotelli(config)#interface s2/0
Balotelli(config-if)#bandwidth 64
Balotelli(config-if)#exit
Balotelli(config)#interface s3/0
Balotelli(config-if)#bandwidth 1024
Balotelli(config-if)#
```

Router 3

```
Puyol>enable
Password:
Puyol#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Puyol(config)#interface s2/0
Puyol(config-if)#exit
Puyol(config)#interface s3/0
Puyol(config-if)#bandwidth 1024
Puyol(config-if)#
```

Como siguiente punto se Verifican las modificaciones del ancho de banda.

Router 1

```
1
1
Xavi>enable
Password:
Xavi#show interface serial2/0
Serial2/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 172.168.3.1/16
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/0/256 (active/max active/max total)
    Reserved Conversations 0/0 (allocated/max allocated)
    Available Bandwidth 48 kilobits/sec
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 102 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    503 packets output, 30180 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions
  DCD=up DSR=up DTR=up RTS=up CTS=up
Xavi#
```

Router 2

```
Password:
Balotelli#show interface serial2/0
Serial2/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 172.168.3.2/16
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/0/256 (active/max active/max total)
    Reserved Conversations 0/0 (allocated/max allocated)
    Available Bandwidth 48 kilobits/sec
  5 minute input rate 104 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    527 packets input, 31620 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
    0 output buffer failures, 0 output buffers swapped out
    0 carrier transitions
  DCD=up DSR=up DTR=up RTS=up CTS=up
```

Router 3.

```
Puyol>enable
Password:
Puyol#show interface serial3/0
Serial3/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.16.10.10/24
  MTU 1500 bytes, BW 1024 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/0/256 (active/max active/max total)
    Reserved Conversations 0/0 (allocated/max allocated)
    Available Bandwidth 768 kilobits/sec
  5 minute input rate 104 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    446 packets input, 26760 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
    0 output buffer failures, 0 output buffers swapped out
```

Como siguiente punto Examine los sucesores y las distancias factibles en la tabla de enrutamiento de Router 2.

```
10.0.0.0/30 is subnetted, 1 subnets
C    10.1.1.0 is directly connected, Loopback1
172.16.0.0/16 is variably subnetted, 4 subnets, 3 masks
D    172.16.0.0/16 is a summary, 00:00:52, Null0
D    172.16.1.0/24 [90/40514560] via 172.16.3.1, 00:00:52, Serial0/0/0
C    172.16.2.0/24 is directly connected, FastEthernet0/0
C    172.16.3.0/30 is directly connected, Serial0/0/0
D    192.168.1.0/24 [90/3014400] via 192.168.10.10, 00:00:11, Serial0/0/1
    192.168.10.0/24 is variably subnetted, 3 subnets, 2 masks
D    192.168.10.0/24 is a summary, 00:00:11, Null0
D    192.168.10.4/30 [90/3523840] via 192.168.10.10, 00:00:11,
```

Siguiendo con la práctica se procede a contestar las siguientes preguntas:

1.- ¿Cuál es la mejor ruta hacia PC1?

De R2 –R1-PC1 Dirección de siguiente salto 172.16.3.1

2.- ¿Cuál es la dirección IP y el nombre del router sucesor en esta ruta?

172.16.3.1 R1 (Xavi).

3.- ¿Cuál es la distancia factible hacia la red en la que se encuentra PC1?

40514560

4.- Examine la tabla de enrutamiento en R1.

```
172.16.0.0/16 is variably subnetted, 4 subnets, 3 masks
D 172.16.0.0/16 is a summary, 00:42:59, Null0
C 172.16.1.0/24 is directly connected, FastEthernet0/0
D 172.16.2.0/24 [90/40514560] via 172.16.3.2, 00:43:00, Serial0/0/0
C 172.16.3.0/30 is directly connected, Serial0/0/0
D 192.168.1.0/24 [90/2172416] via 192.168.10.6, 00:42:26, Serial0/0/1
192.168.10.0/24 is variably subnetted, 3 subnets, 2 masks
D 192.168.10.0/24 is a summary, 00:42:20, Null0
C 192.168.10.4/30 is directly connected, Serial0/0/1
D 192.168.10.8/30 [90/3523840] via 192.168.10.6, 00:42:20,
Serial0/0/1
R1#
```

5.- ¿Cuál es la distancia notificada hacia la red 192.168.1.0?

2172416

6.- Utilice el comando ip eigrp topology para visualizar la tabla de topología EIGRP en el router 2

```
R2#show ip eigrp topology
IP-EIGRP Topology Table for AS 1
Codes: P - Passive, A - Active, U - Update, Q - Query, R - Reply, * -
      - Reply status

P 172.16.2.0/24, 1 successors, FD is 28160
   via Connected, FastEthernet0/0
P 172.16.3.0/30, 1 successors, FD is 40512000
   via Connected, Serial0/0/0
P 192.168.10.8/30, 1 successors, FD is 3011840
   via Connected, Serial0/0/1
P 172.16.0.0/16, 1 successors, FD is 28160
   via Summary (28160/0), Null0
P 192.168.10.0/24, 1 successors, FD is 3011840
   via Summary (3011840/0), Null0
P 172.16.1.0/24, 1 successors, FD is 40514560
   via 172.16.3.1 (40514560/28160), Serial0/0/0
P 192.168.1.0/24, 1 successors, FD is 3014400
   via 192.168.10.10 (3014400/28160), Serial0/0/1
   via 172.16.3.1 (41026560/2172416), Serial0/0/0
P 192.168.10.4/30, 1 successors, FD is 3523840
   via 192.168.10.10 (3523840/2169856), Serial0/0/1
R2#
```

7.- Visualice la información detallada de la topología EIRGP.

```
R2#show ip eigrp topology 192.168.1.0
IP-EIGRP (AS 1): Topology entry for 192.168.1.0/24
State is Passive, Query origin flag is 1, 1 Successor(s), FD is 3014400
Routing Descriptor Blocks:
 192.168.10.10 (Serial0/0/1), from 192.168.10.10, Send flag is 0x0
   Composite metric is (3014400/28160), Route is Internal
   Vector metric:
     Minimum bandwidth is 1024 Kbit
     Total delay is 20100 microseconds
     Reliability is 255/255
     Load is 1/255
     Minimum MTU is 1500
     Hop count is 1
 172.16.3.1 (Serial0/0/0), from 172.16.3.1, Send flag is 0x0
   Composite metric is (41026560/2172416), Route is Internal
   Vector metric:
     Minimum bandwidth is 64 Kbit
     Total delay is 40100 microseconds
     Reliability is 255/255
     Load is 1/255
     Minimum MTU is 1500
     Hop count is 2
R2#
```

8.- ¿Cuál es la distancia factible hacia la red 192.168.1.0?

3014400

9.- ¿Router 2 consideraría a Router1 como un sucesor factible hacia la red 192.168.1.0?

NO

10.- ¿Cuántos sucesores hay para esta red?

1

11.- ¿Cuál es la distancia factible hacia esta red?

3014400

12.- ¿Cuál es la dirección IP del sucesor factible?

192.168.10.10

13.- ¿Cuál es la distancia notificada para 192.168.1.0 desde el sucesor factible?

28160

14.- ¿Cuál sería la distancia factible hacia 192.168.1.0 si R1 fuera el sucesor?

41026560

15.- Examine la tabla de topología EIGRP en Router 3

```
R3#show ip eigrp topology
IP-EIGRP Topology Table for AS 1

Codes: P - Passive, a - Active, U - Update, Q - Query, R - Reply,
       r - Reply status

P 192.168.1.0/24, 1 successors, FD is 28160
   via Connected, FastEthernet0/0
P 192.168.10.4/30, 1 successors, FD is 2169856
   via Connected, Serial0/0/0
P 192.168.10.0/24, 1 successors, FD is 2169856
   via Summary (2169856/0), Null0
P 172.16.0.0/16, 1 successors, FD is 2172416
   via 192.168.10.5 (2172416/28160), Serial0/0/0
   via 192.168.10.9 (3014400/28160), Serial0/0/1
P 192.168.10.8/30, 1 successors, FD is 3011840
   via Connected, Serial0/0/1
```

16.- ¿Por qué el router R1 (192.168.10.5) es el único sucesor para la ruta hacia la red 172.16.0.0/16?

Por qué el enlace de Router 1 y Router 3 tiene un ancho de banda mayor y por lo tanto una métrica menor.

Como siguiente punto desactive el resumen automático en los tres routers con el comando no auto -summary. De la siguiente manera.

Router 1

```
Xavi>enable
Password:
Xavi#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Xavi(config)#router eigrp 1
Xavi(config-router)#no auto-summary
Xavi(config-router)#end
Xavi#
%SYS-5-CONFIG_I: Configured from console by console
```

Router 2

```
-----
Password:
Balotelli#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Balotelli(config)#router eigrp 1
Balotelli(config-router)#no auto-summary
Balotelli(config-router)#end
Balotelli#
%SYS-5-CONFIG_I: Configured from console by console
```

Router 3

```
Puyol>enable
Password:
Password:
Puyol#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Puyol(config)#router eigrp 1
Puyol(config-router)#no auto-summary
Puyol(config-router)#end
Puyol#
%SYS-5-CONFIG_I: Configured from console by console
```

Como siguiente paso agregue dos direcciones loopback, 192.168.2.1/24 y 192.168.3.1/24, al router 3

```
Puyol#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Puyol(config)#interface loopback1

Puyol(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up

Puyol(config-if)#ip address 192.168.2.1 255.255.255.0
Puyol(config-if)#interface loopback2

Puyol(config-if)#
%LINK-5-CHANGED: Interface Loopback2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback2, changed state to up

Puyol(config-if)#ip address 192.168.3.1 255.255.255.0
Puyol(config-if)#end
```

A continuación agregue las redes 192.168.2.0 y 192.168.3.0 a la configuración EIGRP en Router 3.

```
Puyol#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Puyol(config)#router eigrp 1
Puyol(config-router)#network 192.168.2.0
Puyol(config-router)#network 192.168.3.0
Puyol(config-router)#end
Puyol#
%SYS-5-CONFIG_I: Configured from console by console

Puyol#
```

Como siguiente punto verifique las rutas nuevas.

```

      172.16.0.0/16 is variably subnetted, 4 subnets, 3 masks
C       172.16.1.0/24 is directly connected, FastEthernet0/0
D       172.16.2.0/24 [90/3526400] via 192.168.10.6, 00:15:07, Serial0/0/1
C       172.16.3.0/30 is directly connected, Serial0/0/0
D       192.168.1.0/24 [90/2172416] via 192.168.10.6, 00:15:07, Serial0/0/1
D       192.168.2.0/24 [90/2297856] via 192.168.10.6, 00:01:07, Serial0/0/1
D       192.168.3.0/24 [90/2297856] via 192.168.10.6, 00:00:57, Serial0/0/1
      192.168.10.0/24 is variably subnetted, 3 subnets, 2 masks
C       192.168.10.4/30 is directly connected, Serial0/0/1
D       192.168.10.8/30 [90/3523840] via 192.168.10.6, 00:15:07, Serial0/0/1
R1#
```

Conclusión

En esta práctica se fundamentaron las configuraciones iniciales de un router las cuales constan del cambio de nombre, asignación de una contraseña y un banner de saludo inicial cada vez que entramos de manera comandos al router. Así como también se levantaron los puertos seriales y los fastethernet0/0 de los mismos, se pudo observar de igual forma la asignación de direcciones IP a cada una de las pcs. Se pudo observar de igual manera la configuración del protocolo EIGRP a uno de los Routers gracias a los comandos.