

Actividad | 3 | Configuración del router.

Administración de redes y servidores.

Ingeniería en Desarrollo de
Software.



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Introducción

Un enrutador es un dispositivo que conecta dos o más redes o subredes de conmutación de paquetes. Cumple dos funciones principales: Gestionar el tráfico entre estas redes mediante el reenvío de paquetes de datos a sus direcciones IP previstas, y permite que varios dispositivos utilicen la misma conexión de internet.

Hay varios tipos de enrutadores, pero la mayoría de ellos pasan datos entre las LAN (redes de área local) y WAN (redes de área amplia). Una LAN es un grupo de dispositivos conectados restringidos a una zona geográfica concreta. Una LAN suele necesitar de un solo enrutador.

En cambio, una WAN es una gran red extendida por una amplia zona geográfica. Por ejemplo, las grandes organizaciones y empresas que operan en varios lugares del país necesitaran redes LAN separadas para cada lugar, que luego se conectan a otras LAN para formar una WAN. Ya que una WAN está distribuida por una zona grande, suele necesitar varios enrutadores y conmutadores.

Un enrutador es como un controlador aéreo y los paquetes de datos son los aviones que se dirigen a diferentes aeropuertos (o redes). Al igual que cada avión tiene un destino y ruta únicos, cada paquete debe ser guiado a su destino de la forma más eficiente posible. De la misma forma que un controlador aéreo se asegura de que los aviones lleguen a su destino sin perderse o sufrir interrupciones en el camino, un enrutador ayuda a dirigir los paquetes de datos a su dirección IP de destino.

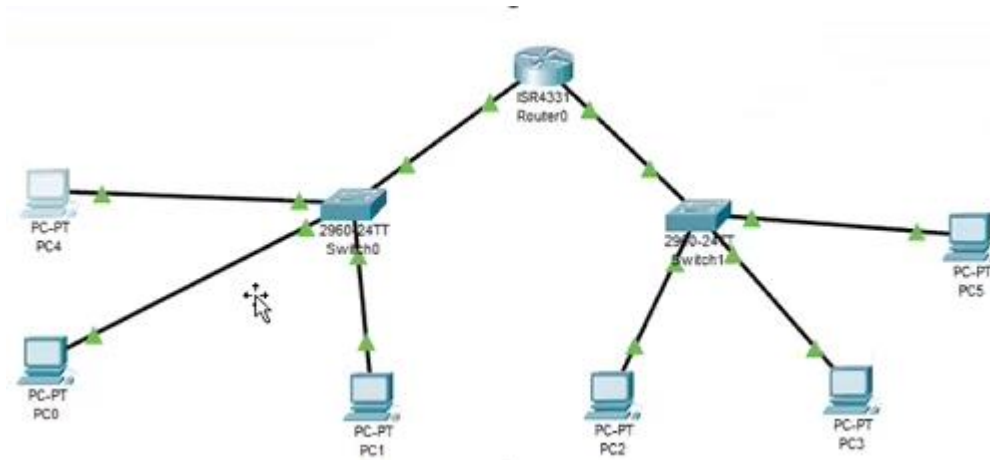
Para dirigir los paquetes de forma eficaz, un enrutador utiliza una tabla de enrutamiento interna: una lista de rutas a varios destinos de la red. El enrutador lee la cabecera de un paquete para determinar a donde va, y luego consulta la tabla de enrutamiento para averiguar la ruta más eficiente hacia ese destino. A continuación, reenvía el paquete a la siguiente red de la ruta.

Descripción

Contextualización:

Siguiendo las actividades pasadas, agregar un router que conecte los dos switches y realizar la siguiente configuración:

- Nombre: R1.
- Agregar contraseña.
- Acceso a los dispositivos (Line vty 0 4).
- Interfaces del Router.
- Gigabit Ethernet 0/0/0.
- Serial Ethernet.
- Interfaces loopback IPv4.



Actividad:

Hacer un ping entre todas las pc para verificar su conectividad.

Agregar un router que se conecte a los dos switch llevara configuración Telnet y de SSH, además de su configuración básica.

Justificación

En esta actividad continuamos con la configuración realizadas en el trabajo 1 y 2, aunque en este caso se realizara el escenario desde cero. En este caso crearemos dos redes nuevas con 2 computadoras cada una y estas redes están conectadas a un router. Aprenderemos a configurar el router, para administrar las comunicaciones de los switch a través del router, el cual nos va a permitir no solo la administración de las dos vlan, sino además si seguridad al implementar primero el protocolo Telnet y luego el protocolo SSH el cual nos va a permitir la conexión desde los equipos al router de manera segura con los campos predefinidos con cifrado de caracteres de 512 bits, además de usuario y contraseña segura.

Seguiremos trabajando con la herramienta llamada Cisco Packet Tracer la cual la cual hace el trabajo muy divertido y fácil.

Este trabajo me gustó mucho y la forma de explicar del profesor no deja lugar a dudas por su gran experticia en el tema y en la herramienta que utilizamos.

Este trabajo fue subido al siguiente enlace de GitHub

<https://github.com/CarlosNico/Administraci-ndeRedesyServidores>

Desarrollo

Comandos utilizados

En esta parte del trabajo pondremos y explicaremos los comandos utilizados para la configuración del router.

Configuración del nombre del router a R1:

- enable - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- configure terminal - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- hostname R1 – Comando para cambiarle el nombre al router a R1
- write memory – Comando para guardar los cambios en el hostname
- exit – Comando para salir de la configuración.

Configuración básica del router:

1- Configuración del switch0 en el router:

- enable - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- configure terminal - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- interface gigabitEthernet 0/0/0 – Comando para acceder a la interfase mencionada para configurar su ip.

- `ip address 192.168.10.254 255.255.255.0` – Comando para asignar la ip (192.168.10.254) a la interfaz seleccionada y su máscara de red (255.255.255.0).
- `exit` – Comando para salir de la configuración.

2- Configuración del switch0 en el router:

- `enable` - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- `configure terminal` - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- `interface gigabitEthernet 0/0/1` – Comando para acceder a la interface mencionada para configurar su ip.
- `ip address 192.168.20.254 255.255.255.0` – Comando para asignar la ip (192.168.20.254) a la interfaz seleccionada y su máscara de red (255.255.255.0).
- `exit` – Comando para salir de la configuración.

3- Encender puertos del router en donde están conectados los switch0 y switch1

Switch0

- `enable` - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- `configure terminal` - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- `interface gigabitEthernet 0/0/0` – Comando para acceder a la interface
- `no shutdown` – Comando encender la interfaz anteriormente elegida
- `exit` – Comando para salir de la configuración.

Switch1

- enable - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- configure terminal - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- interface gigabitEthernet 0/0/1 – Comando para acceder a la interface
- no shutdown – Comando encender la interfaz anteriormente elegida
- exit – Comando para salir de la configuración.

Configuración del telnet:

- enable - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- configure terminal - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- line vty 0 15 – Comando para configurar las líneas virtuales de terminal, que son terminales que se van a usar para administrar el dispositivo de manera remota. Vty define que se está configurando una línea virtual de terminal y 0 15 se especifica el rango de 16 líneas virtuales (desde 0 a 15) ósea 16 sesiones remotas concurrentes para administrar el dispositivo.
- password 1mperi0R0m4no – Comando para establecer la contraseña para el acceso remoto a la administración.
- Login – Comando para habilitar la autenticación simple basada en la contraseña configurada en el paso anterior.
- end – Comando que se utiliza para salir del modo configuración y regresar al modo privilegiado.

- exit – Comando para salir de la configuración.

Configuración de SSH:

- enable - Comando con el que entramos en el modo privilegiado para poder ejecutar comandos de configuración
- configure terminal - Comando con el que entramos en la configuración global donde se pueden realizar modificaciones de todo el sistema
- ip domain-name prueba.edu.mx – Comando para configurar un nombre de dominio en el router. Esto es útil para habilitar características relacionadas con resolución de nombres, como la generación de claves criptográficas para SSH o la integración con servicios DNS.
- Crypto key generate rsa – Comando para generar un par de claves RSA que son necesarias para la configuración y el uso de SSH.
- 512 – Comando para generar claves RSA con una longitud de 512 bits.
- Ip ssh versión 2 – Comando para configurar el servidor SSH para que utilice la versión 2 del protocolo SSH. La versión 2 es más segura que la versión 1 y ofrece un cifrado mejorado y una mejor protección contra ataques.
- Username Administracion privilege 15 secret \$kvalQ13r. – Comando para generar un usuario de administración llamado Administracion con el máximo privilegio (15) y con la contraseña \$kvalQ13r. .
- line vty 0 – Comando para configurar las líneas virtuales de terminal, que son terminales que se van a usar para administrar el dispositivo de manera remota. Vty define que se está configurando una línea virtual de terminal y 0 se especifica el rango de 1 líneas virtuales ósea 1 sesión remota concurrentes para administrar el dispositivo.

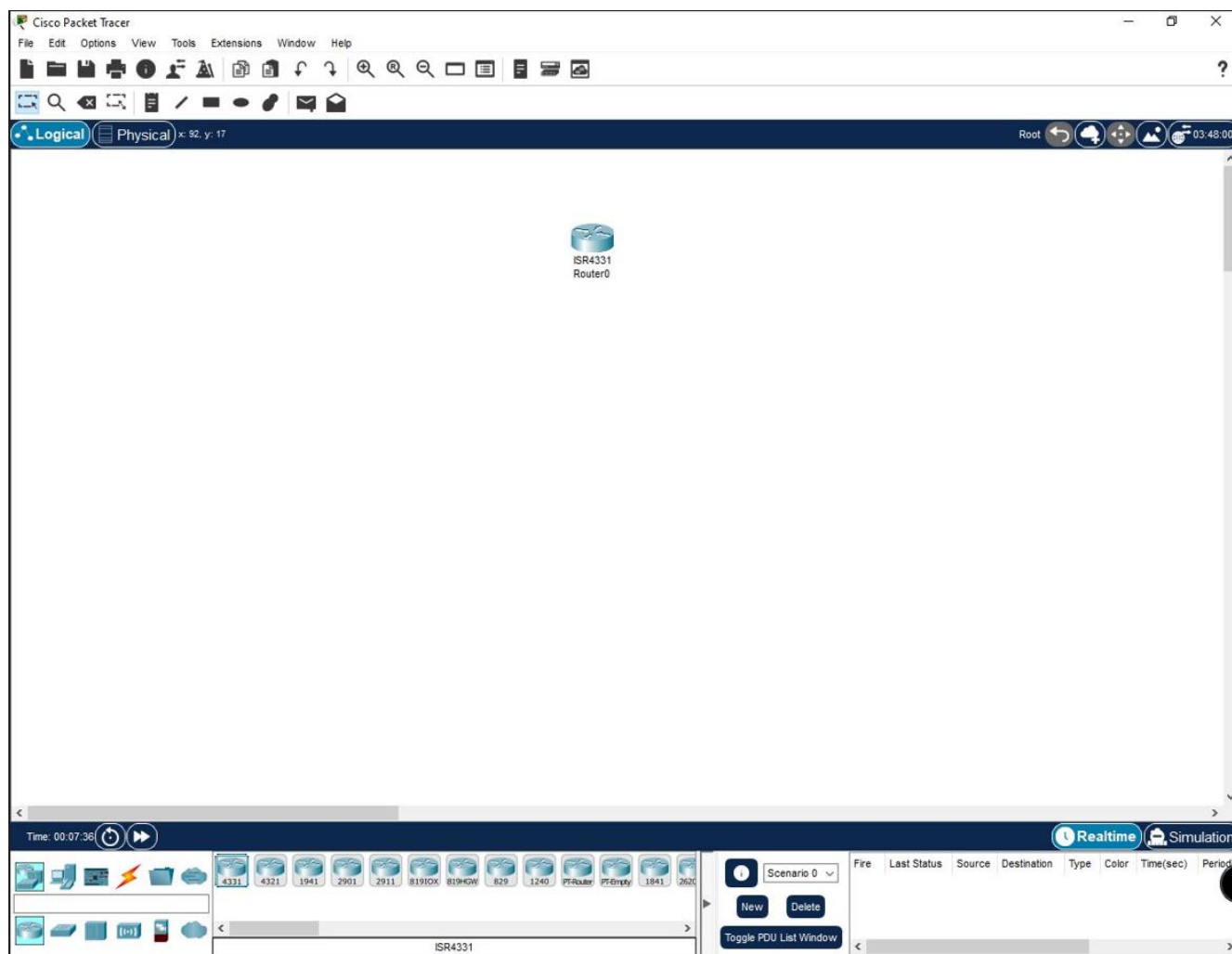
- `transport input ssh` - Comando que restringe las conexiones entrantes para que solo utilicen SSH para un acceso seguro y cifrado al dispositivo. Impide que se utilicen otros protocolos como telnet.
- `Login local` – Comando para configurar y mejorar la seguridad al garantizar que solo los usuarios con credenciales validas puedan conectarse.
- `exit` – Comando para salir de la configuración.

Capturas de pantalla

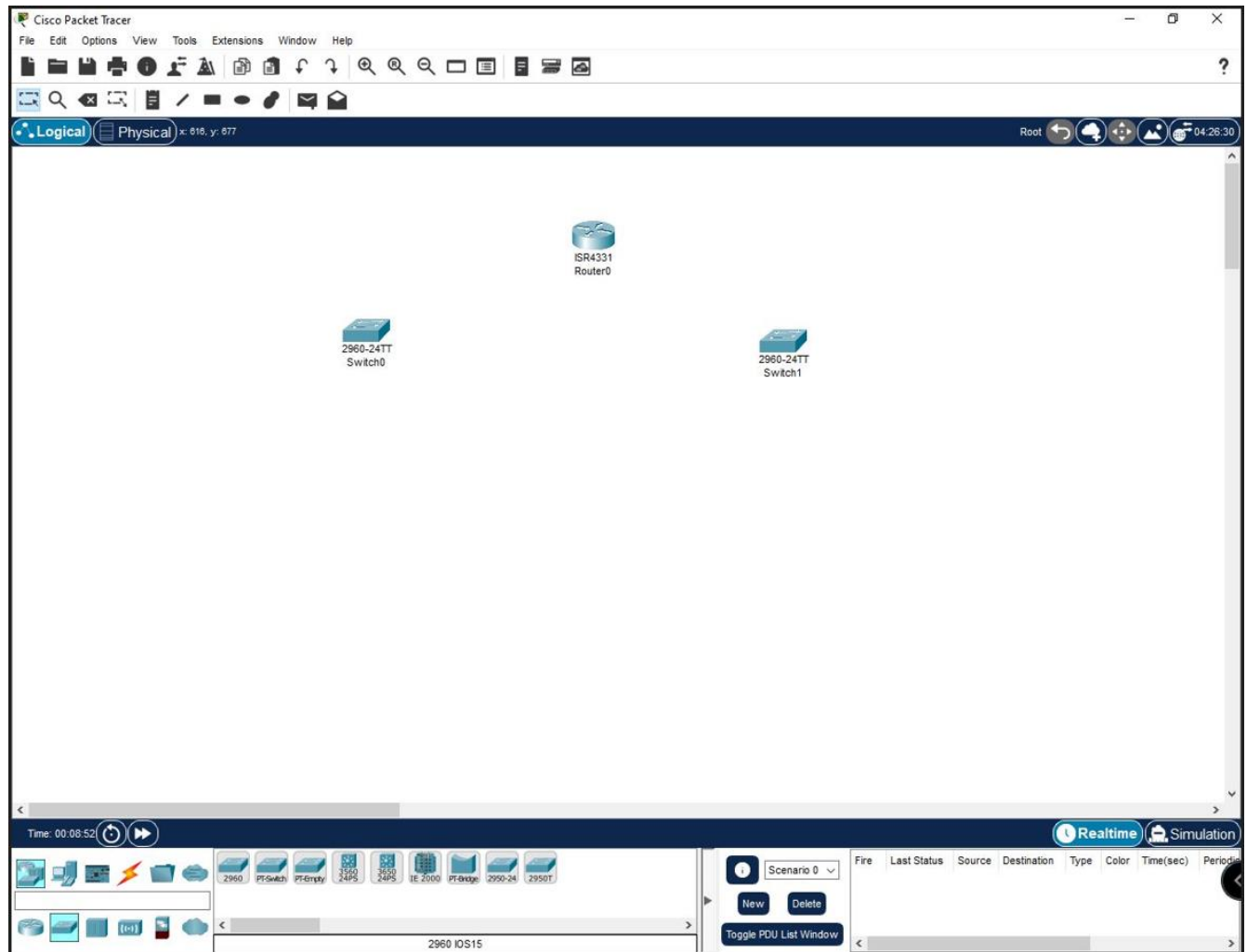
A continuación presentaremos las capturas de pantalla de los procedimientos realizados para esta tarea.

Creación de escenario.

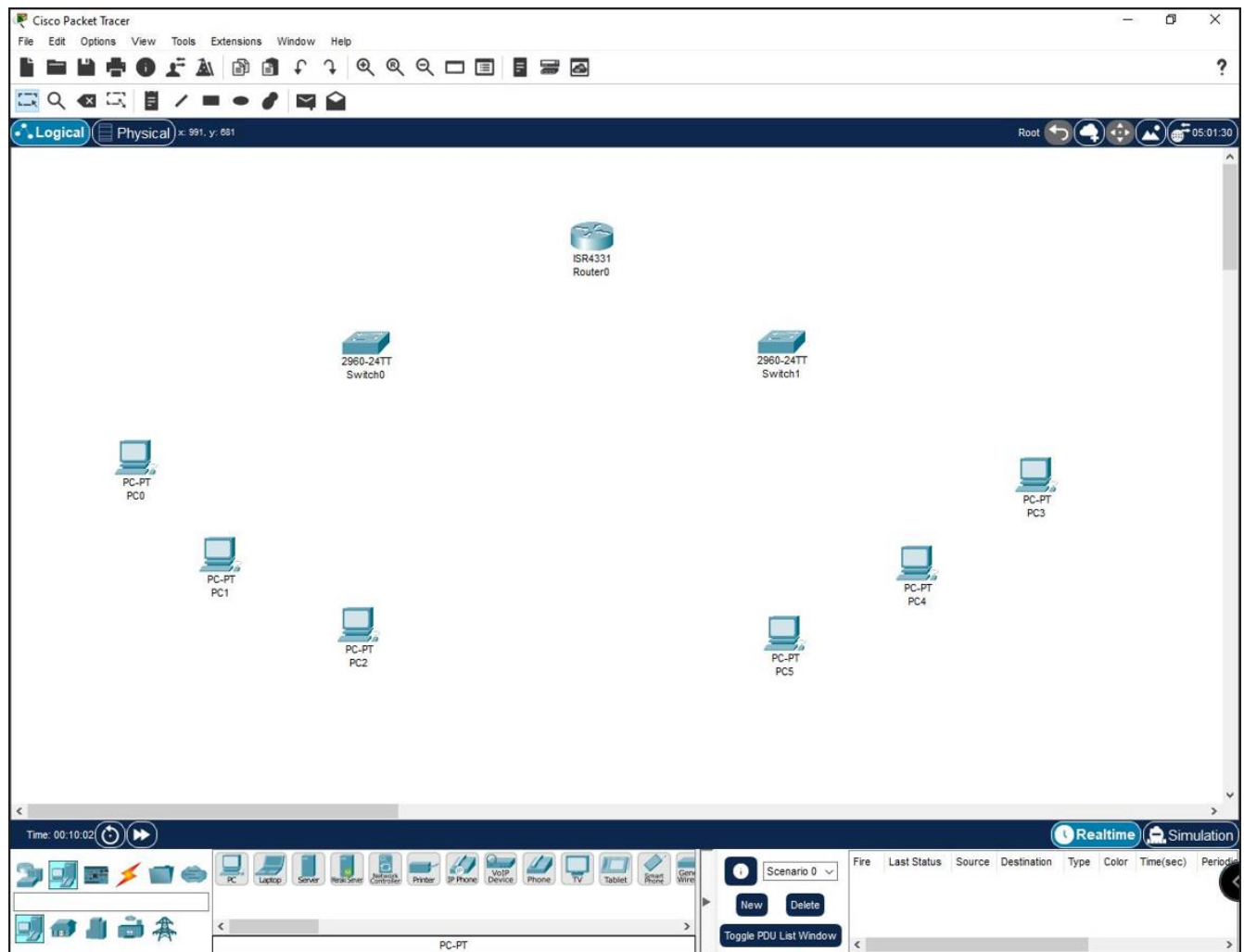
Se asigna un router al ambiente



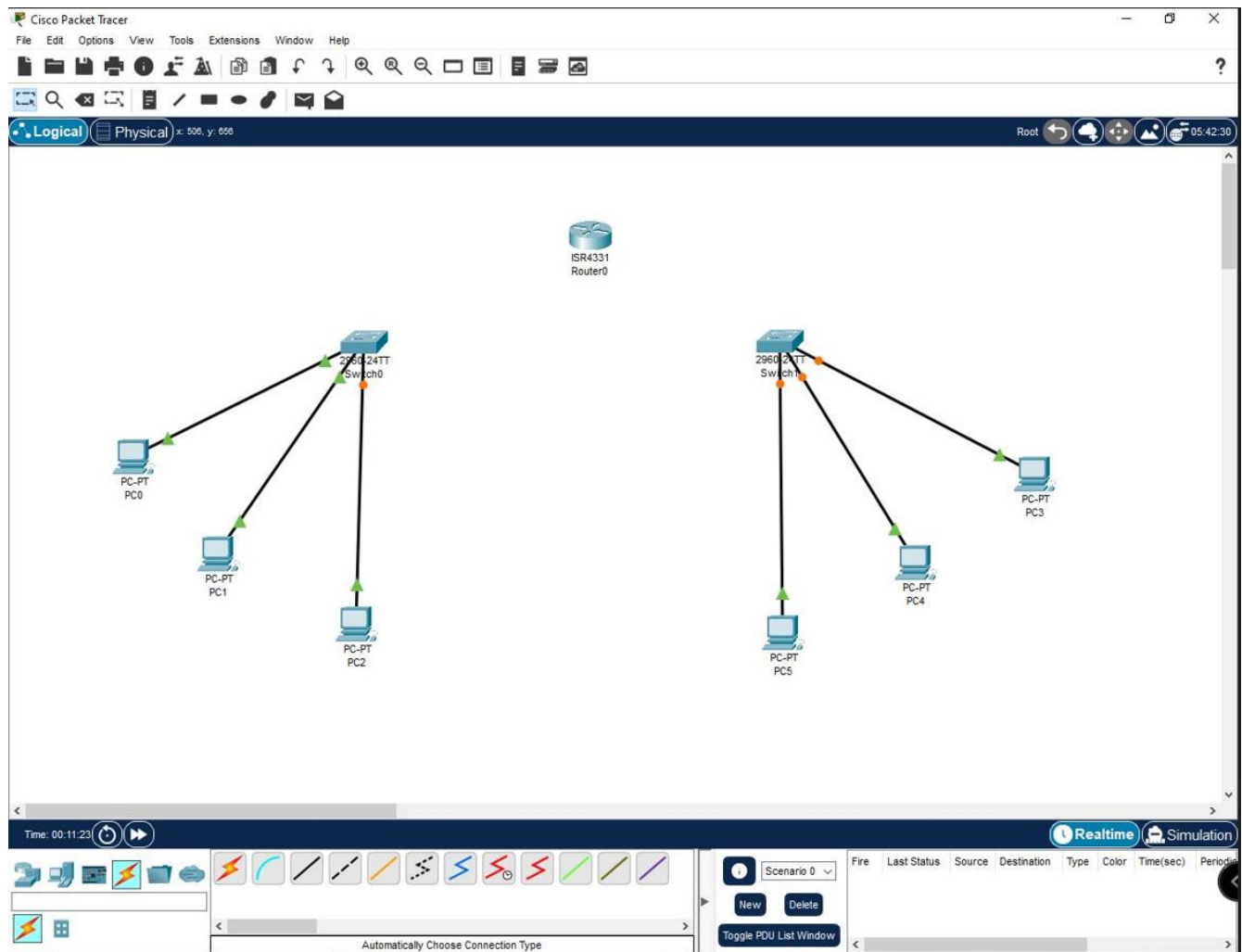
Se ponen dos Switch para el escenario.



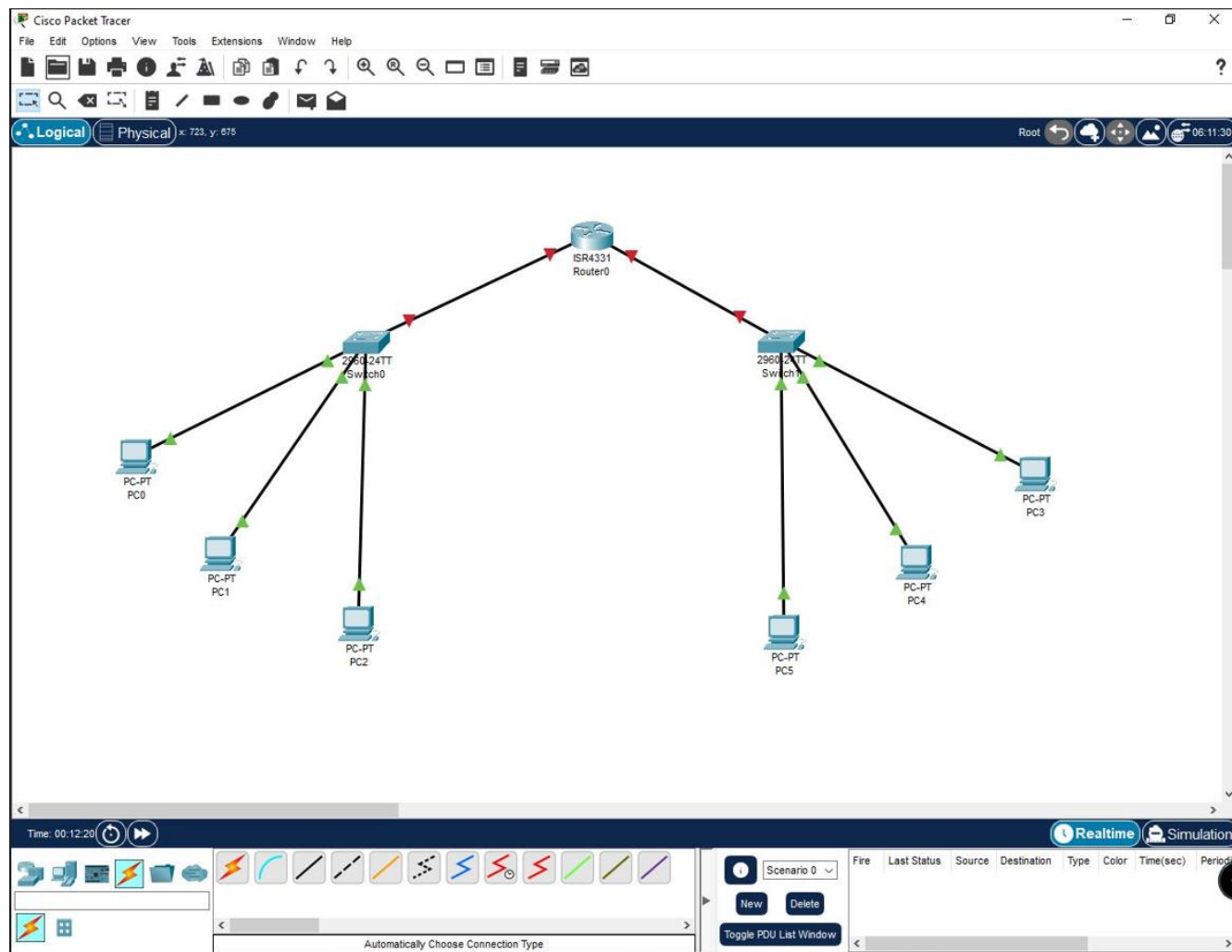
Se agregan 3 equipos por Switch (en total 6)



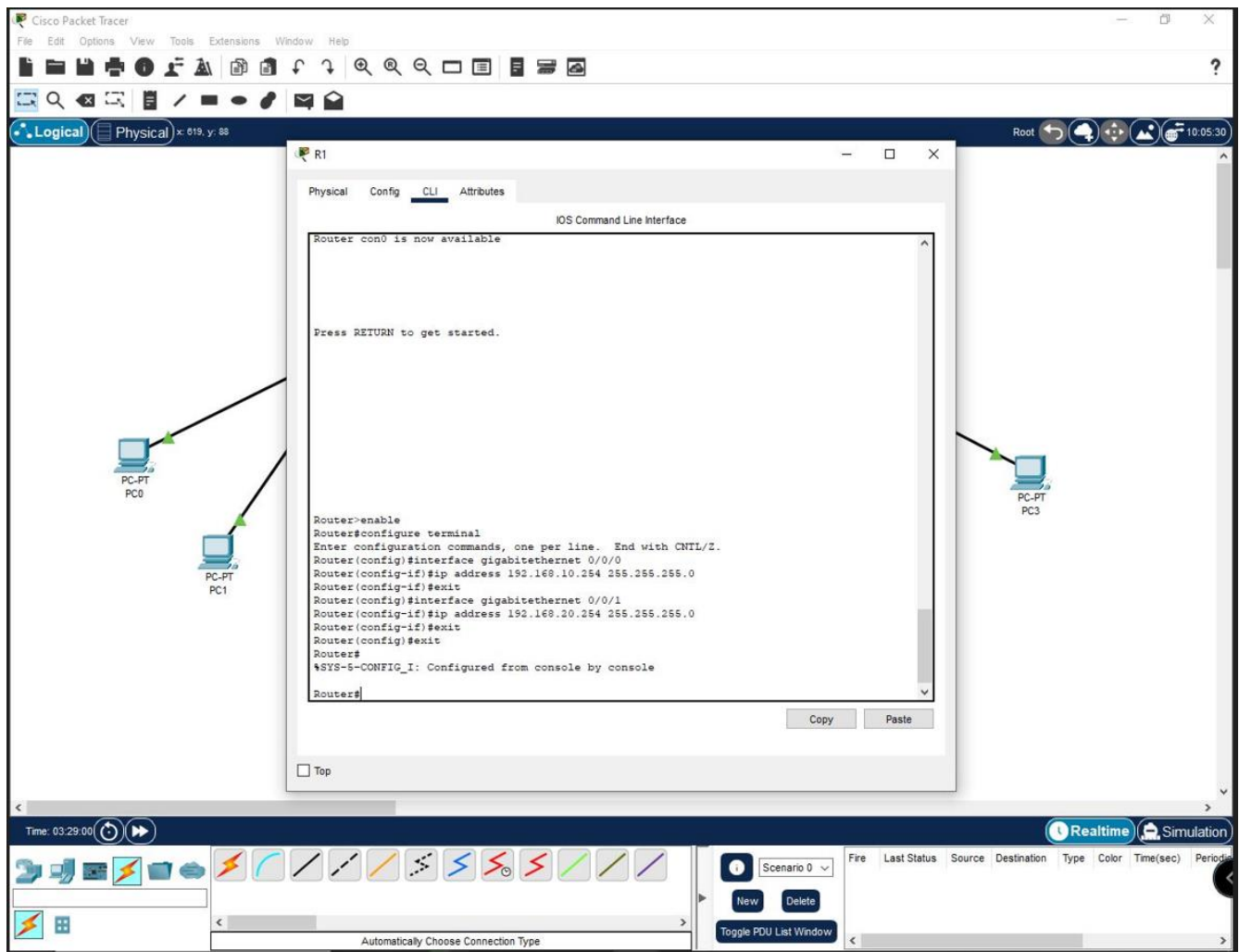
Se realizan las conexiones entre respectivas computadoras con sus Switchs.



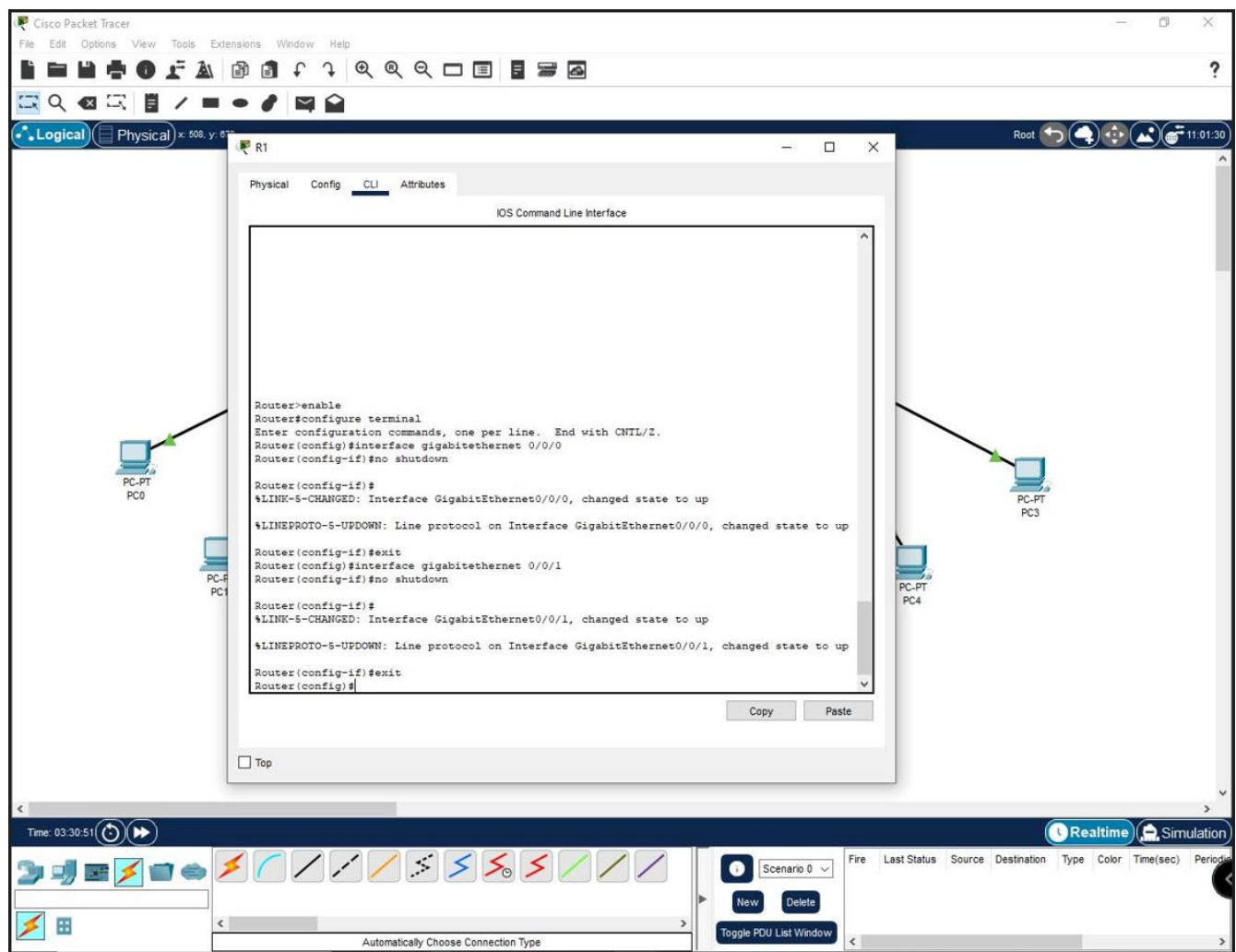
Se realiza la conexión de los switch al router. Los switch deben estar conectados al Router en los puertos Gigabit para su mejor desempeño.



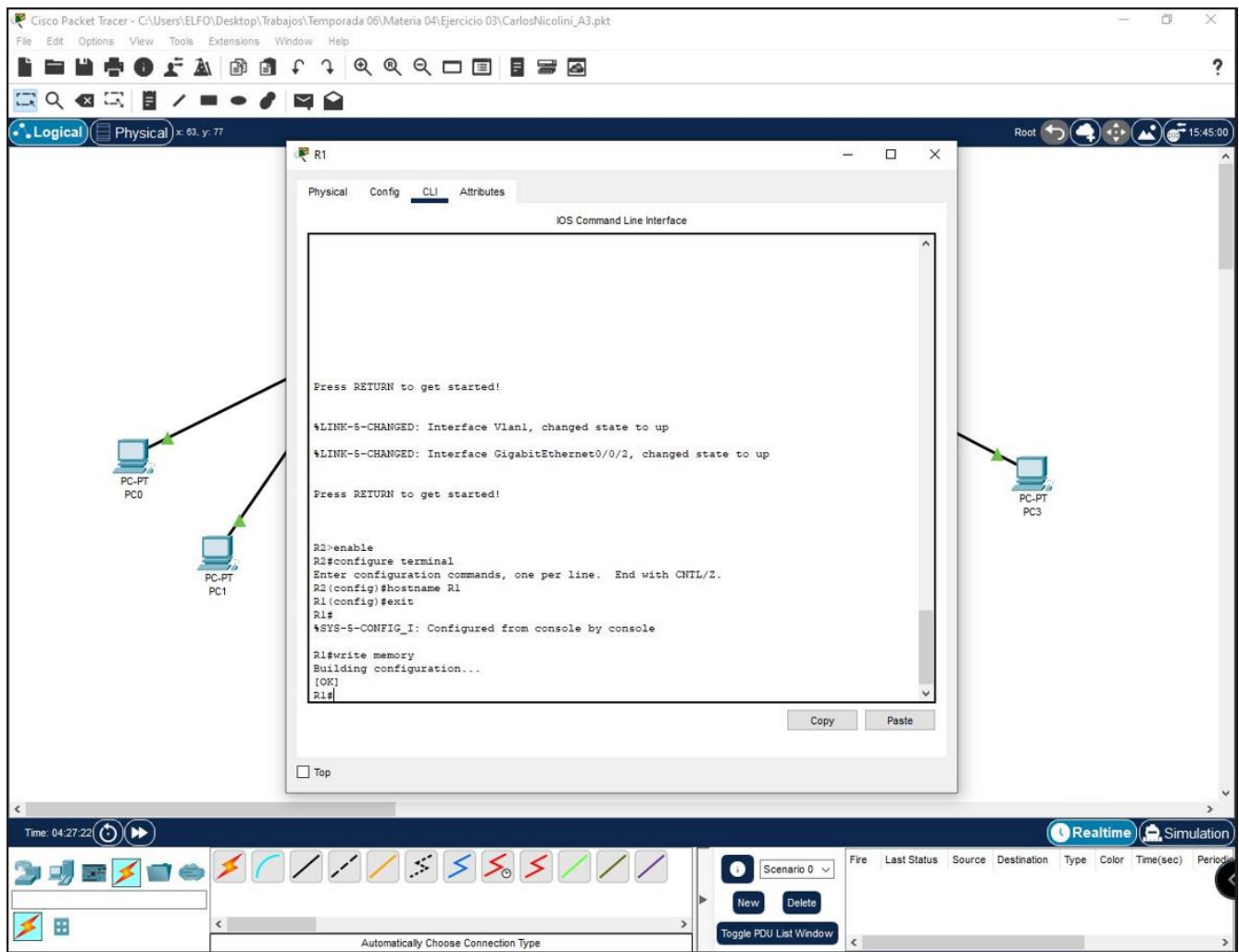
Se le asigna la ip y la máscara de red en el router a los switch.



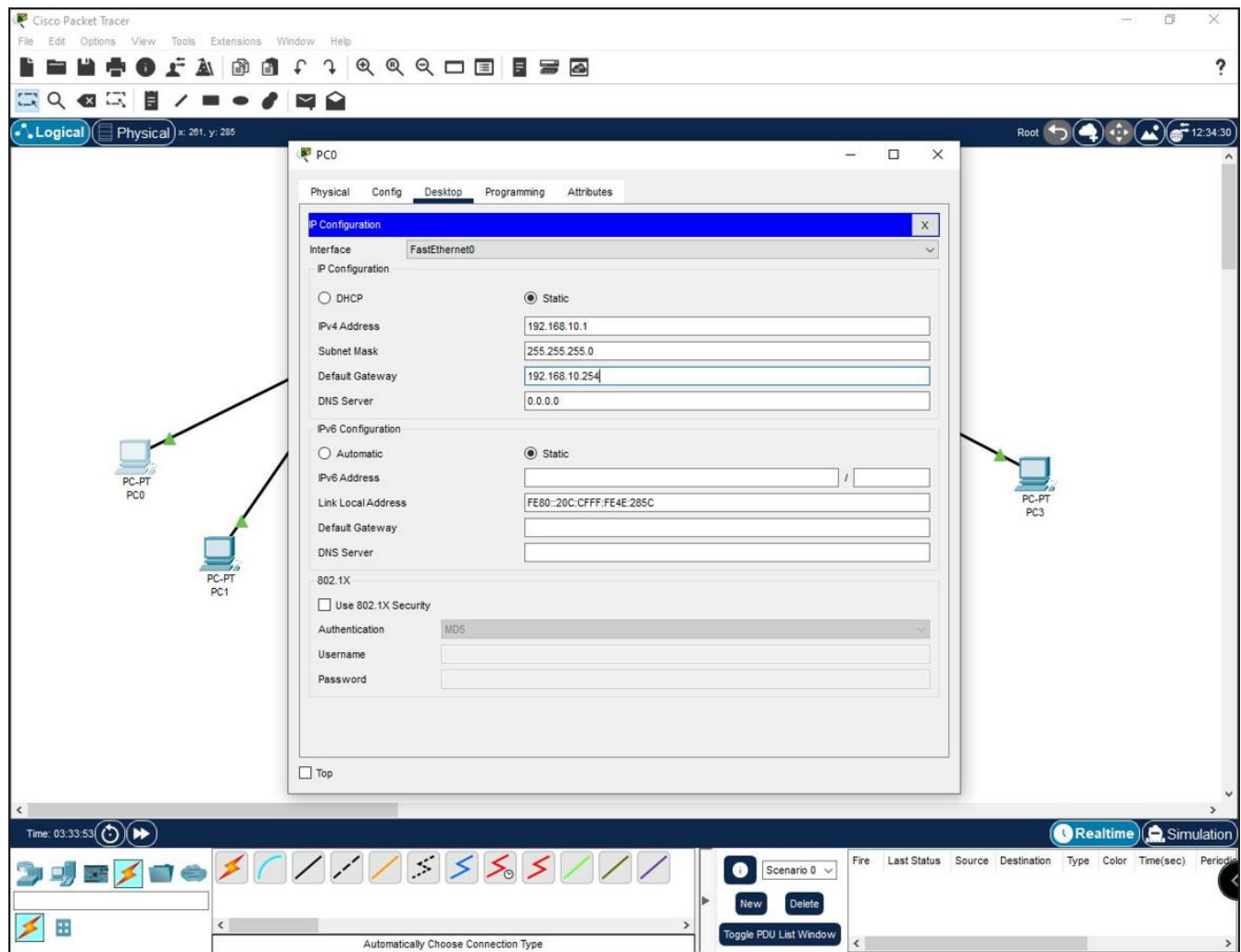
Se encienden los puertos de los switch en el router.



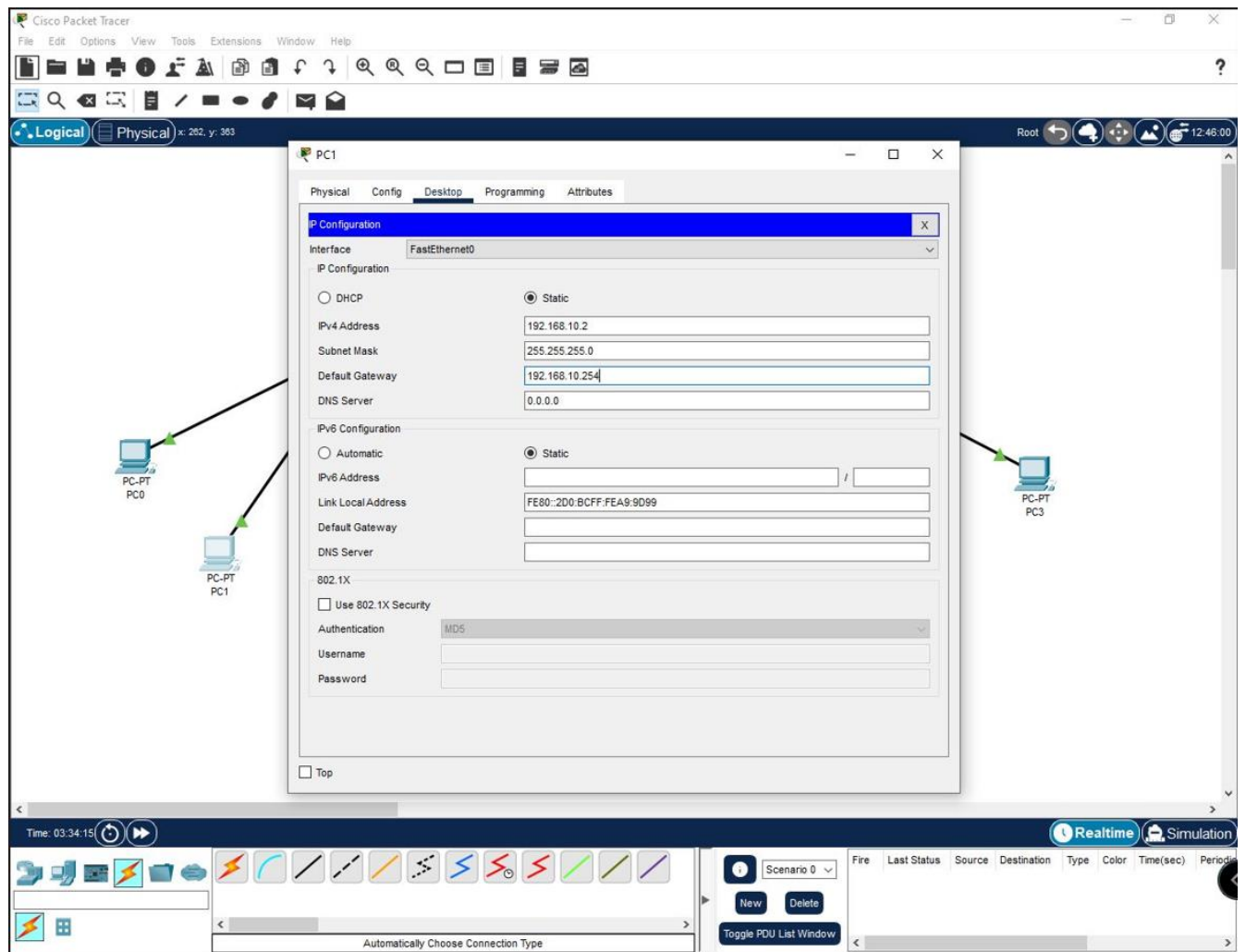
Se configura el nombre del router.



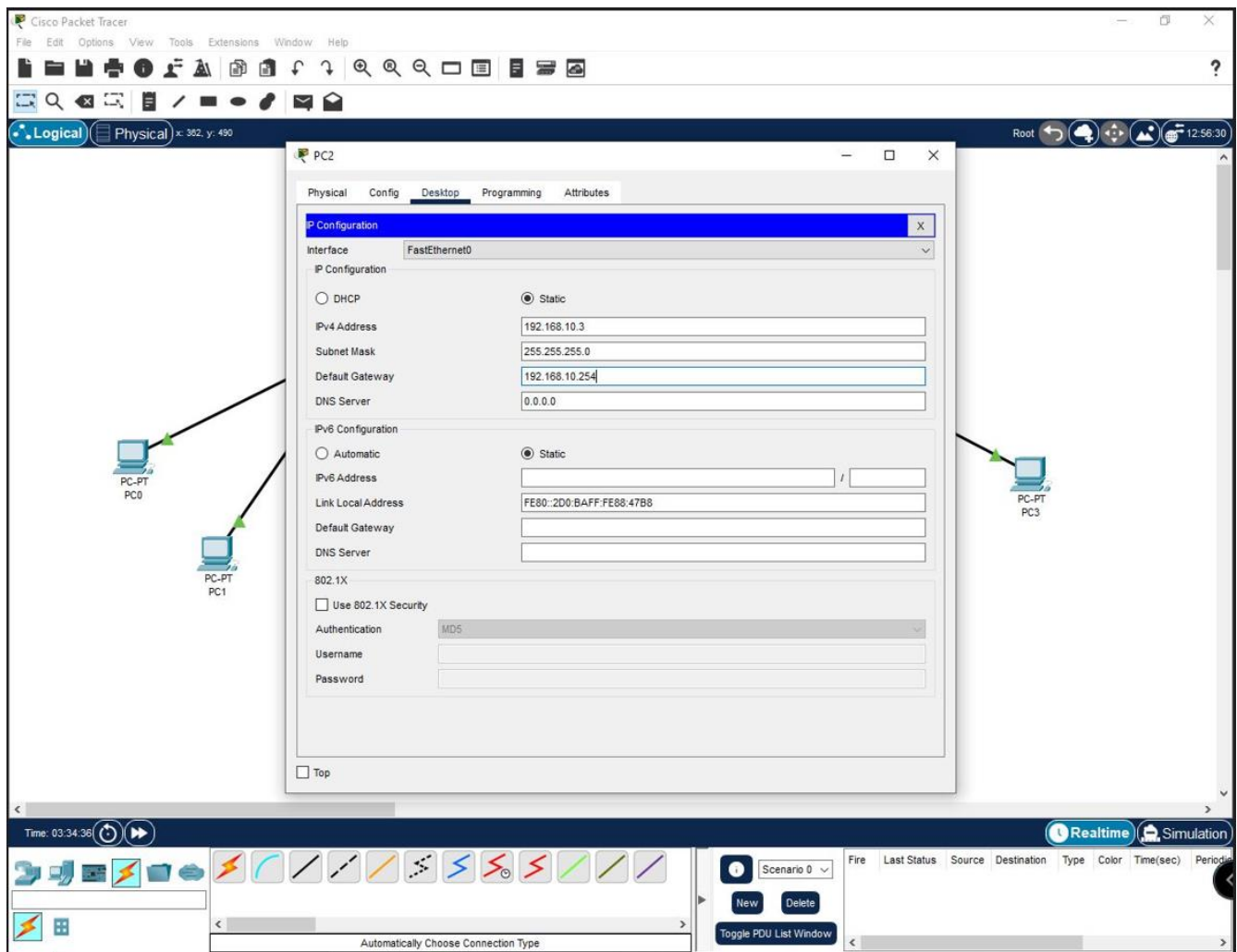
Se asigna la ip a la PC0 que está conectado al switch0.



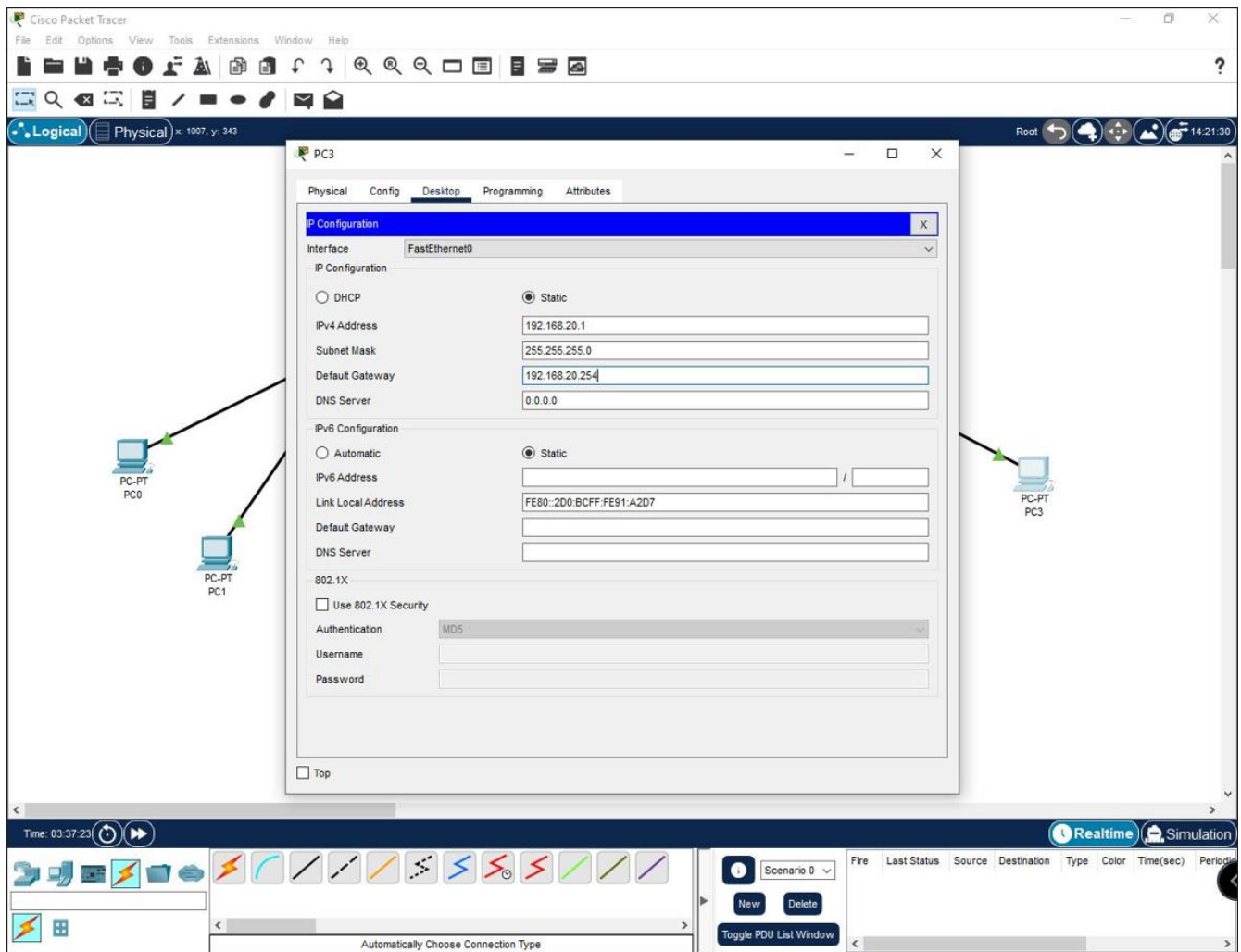
Se asigna la ip a la PC1 que está conectado al switch0.



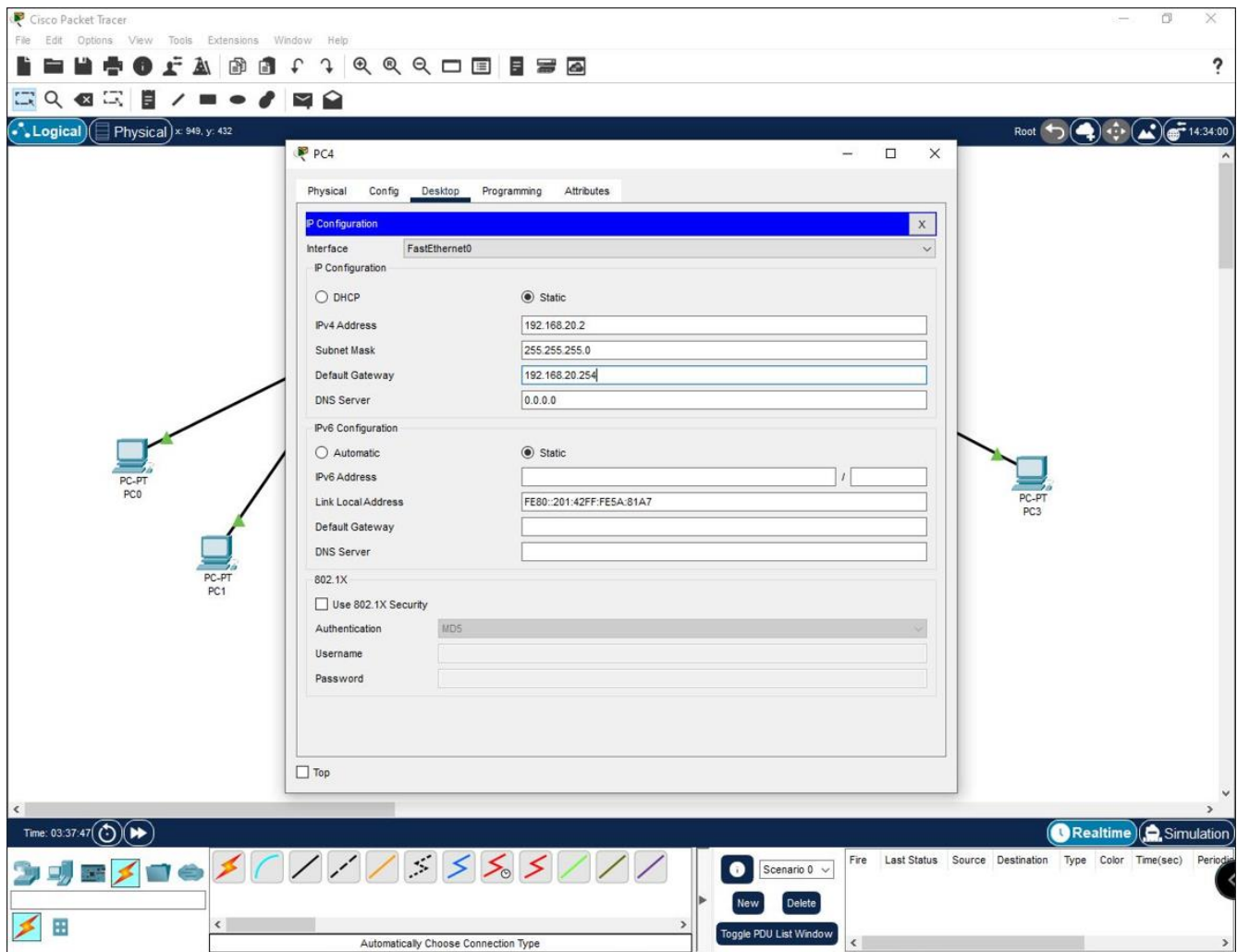
Se asigna la ip a la PC2 que está conectado al switch0.



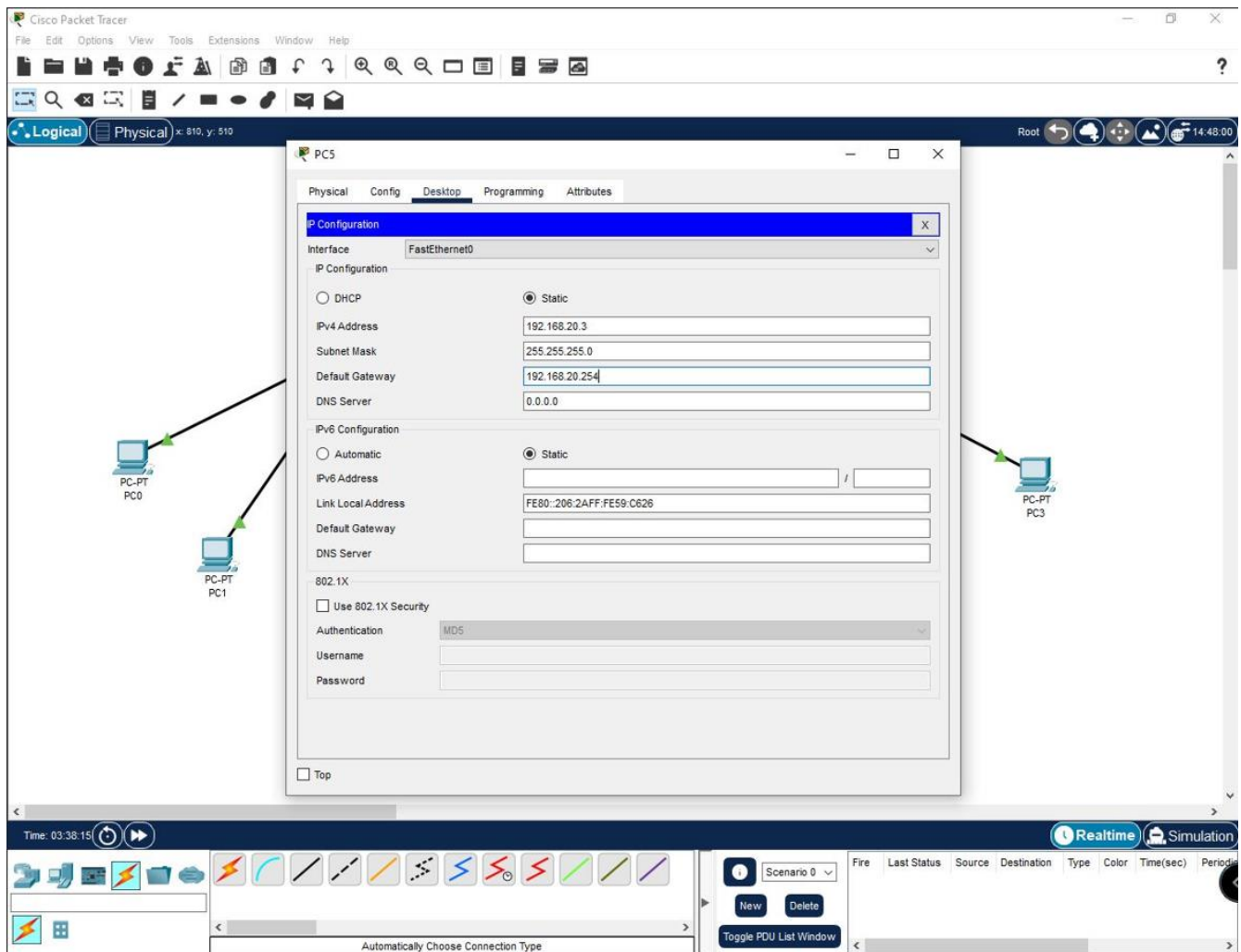
Se asigna la ip a la PC3 que está conectado al switch1.



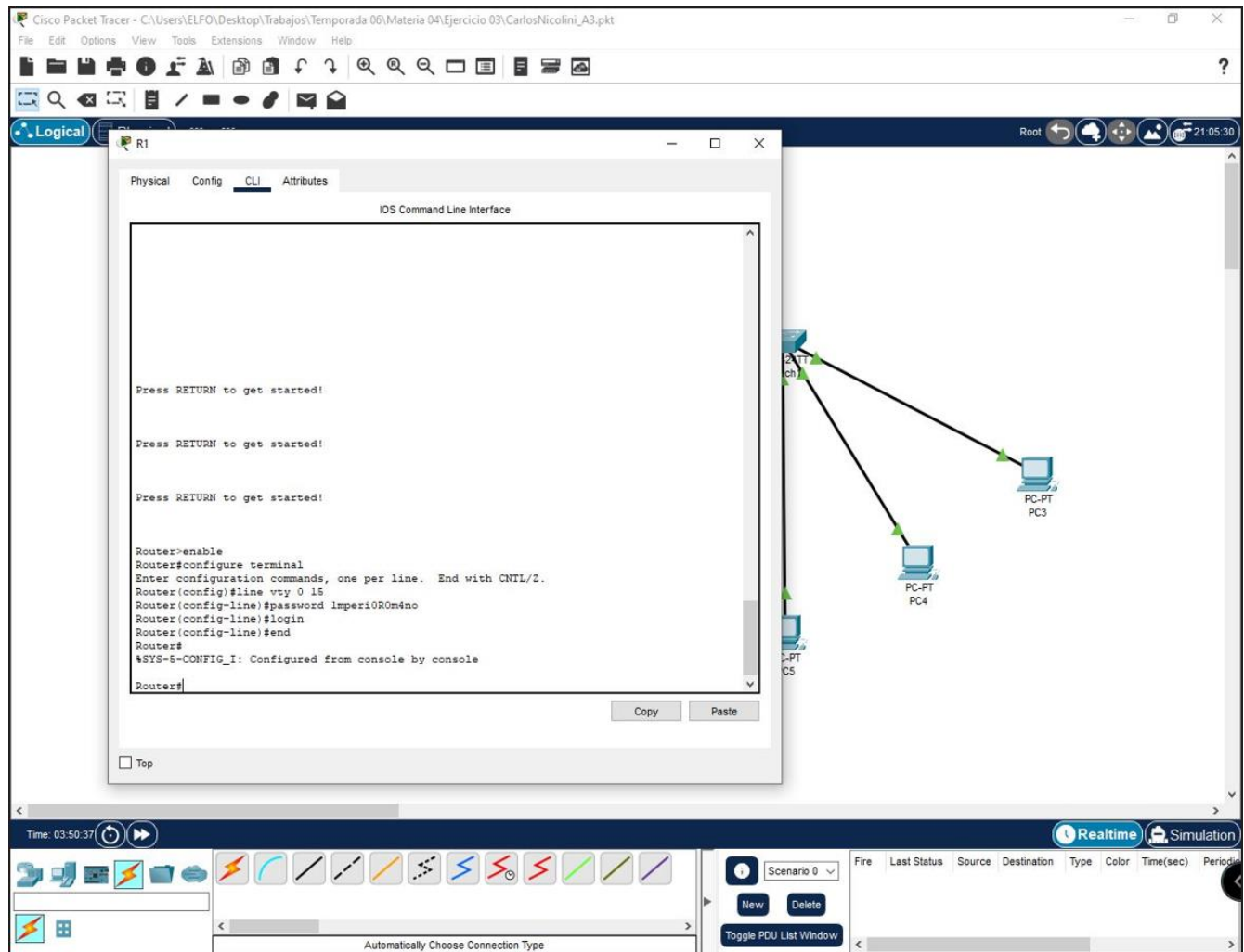
Se asigna la ip a la PC4 que está conectado al switch1.



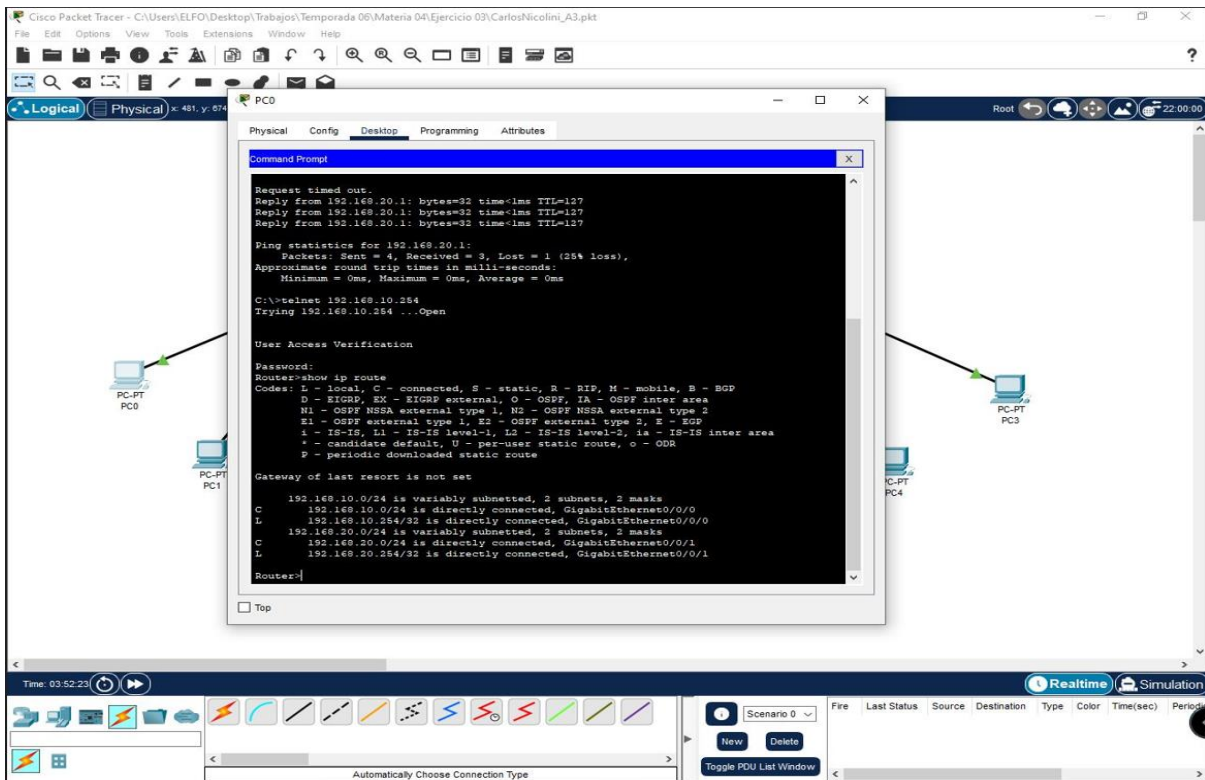
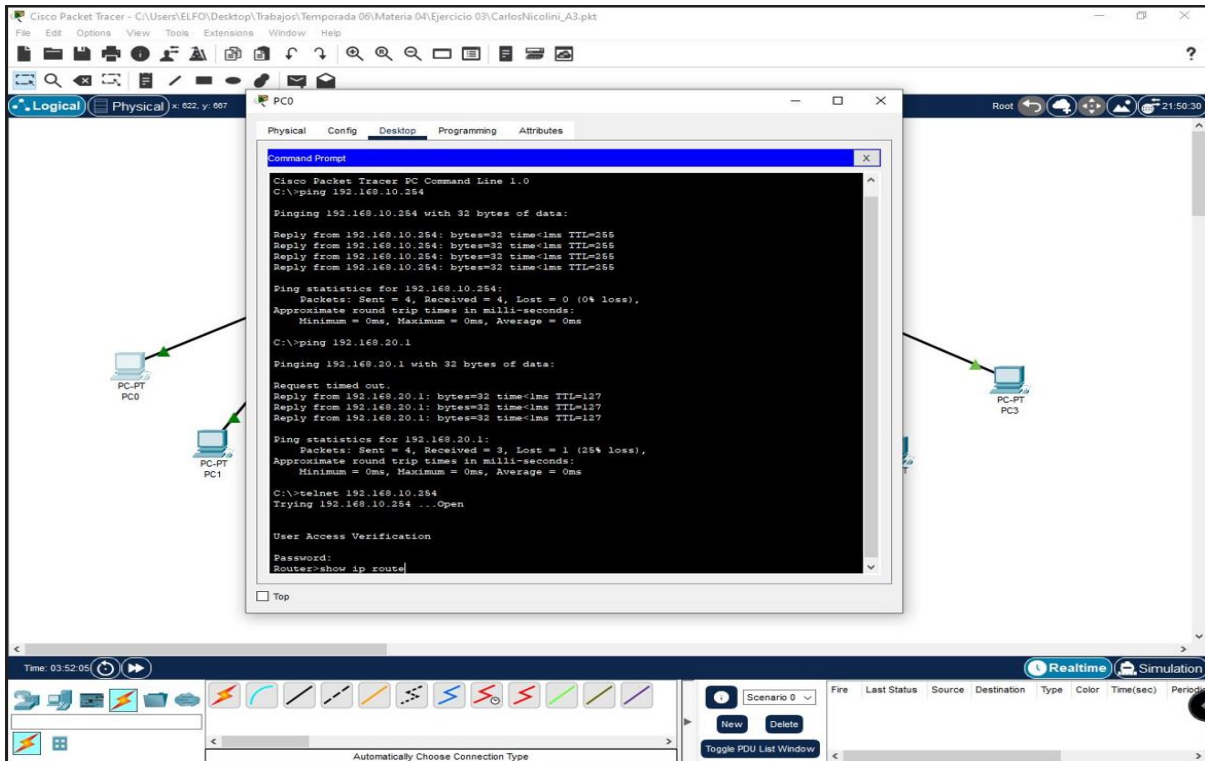
Se asigna la ip a la PC5 que está conectado al switch1.



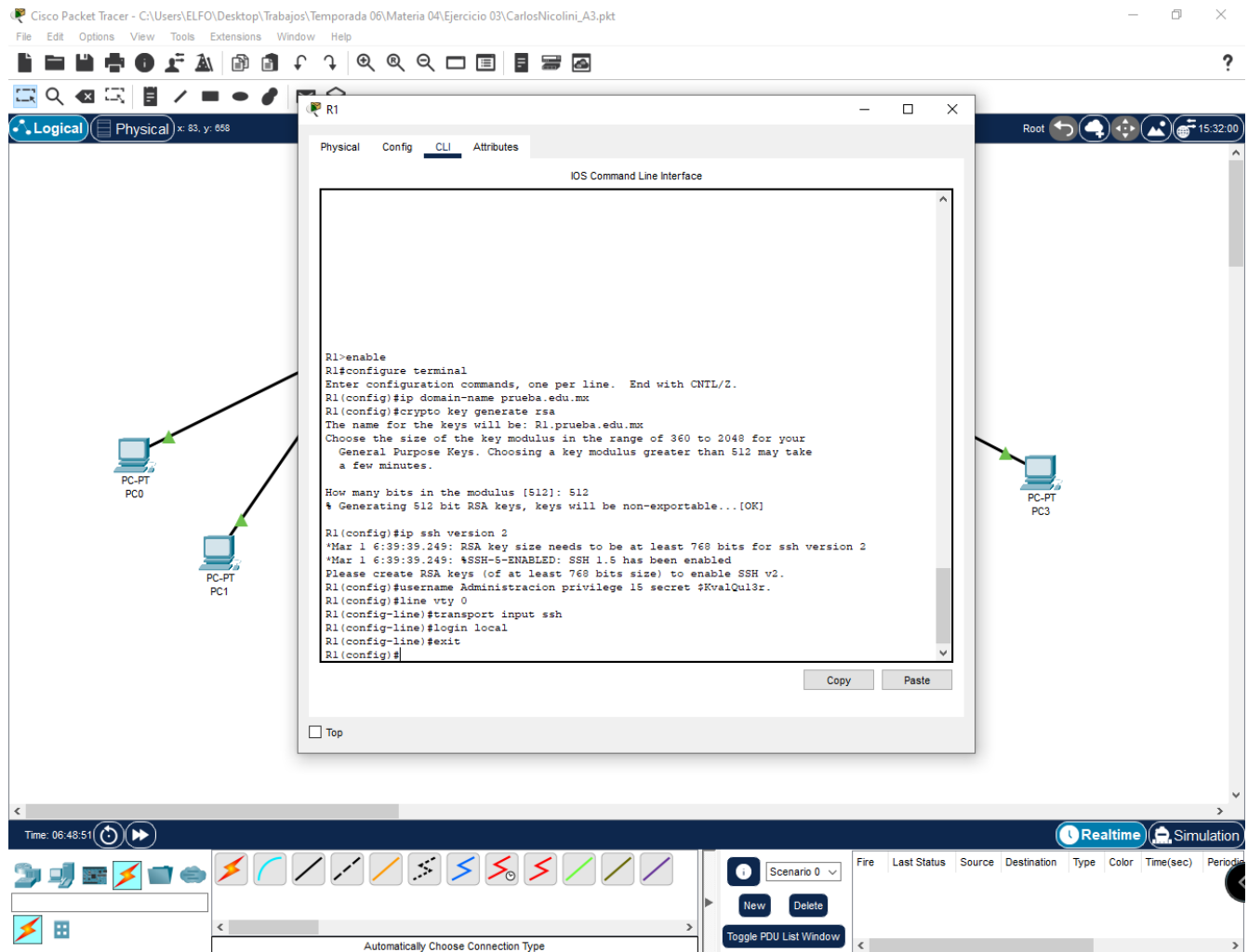
Configuración de telnet



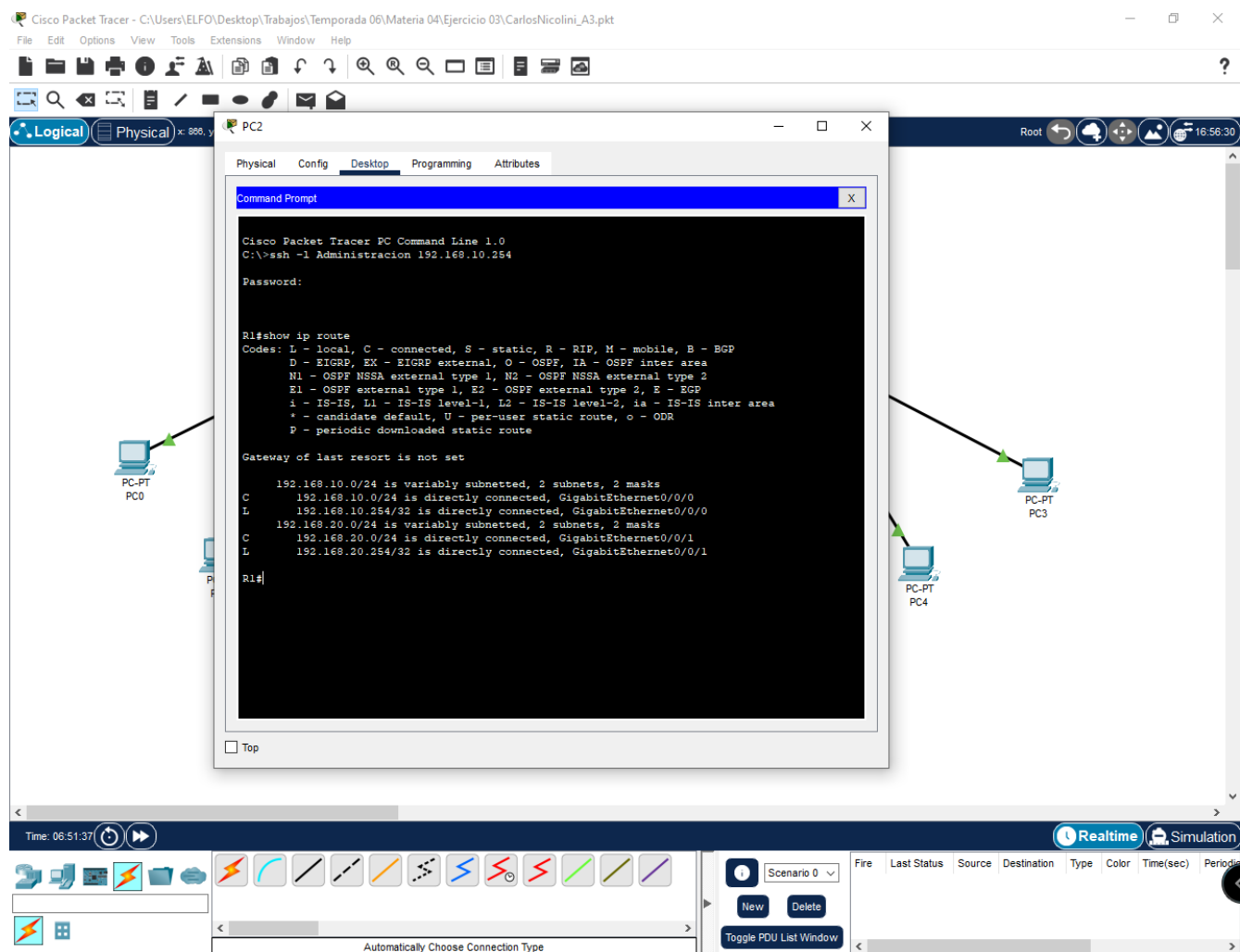
Prueba de telnet desde el equipo PC0 donde se usa la contraseña definida para su acceso.



Configuración en el router de SSH.



Prueba de conexión SSH desde la computadora PC2.



Pruebas de Ping desde computadora PC0 (ip 192.168.10.1)

PC1 (192.168.10.2)

```

PC0
Physical Config Desktop Programming Attributes
Command Prompt
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - RGP
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

192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.10.0/24 is directly connected, GigabitEthernet0/0/0
L 192.168.10.254/32 is directly connected, GigabitEthernet0/0/0
192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.20.0/24 is directly connected, GigabitEthernet0/0/1
L 192.168.20.254/32 is directly connected, GigabitEthernet0/0/1

Router>
[Connection to 192.168.10.254 closed by foreign host]
C:\>
C:\>cls
Invalid Command.

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```

PC2 (192.168.10.3)

```

PC0
Physical Config Desktop Programming Attributes
Command Prompt

Router>
[Connection to 192.168.10.254 closed by foreign host]
C:\>
C:\>cls
Invalid Command.

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```

PC4 (192.168.20.1)

```

PC0
Physical Config Desktop Programming Attributes
Command Prompt

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```

PC5 (192.168.20.2)

```

PC0
Physical Config Desktop Programming Attributes
Command Prompt

Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.2

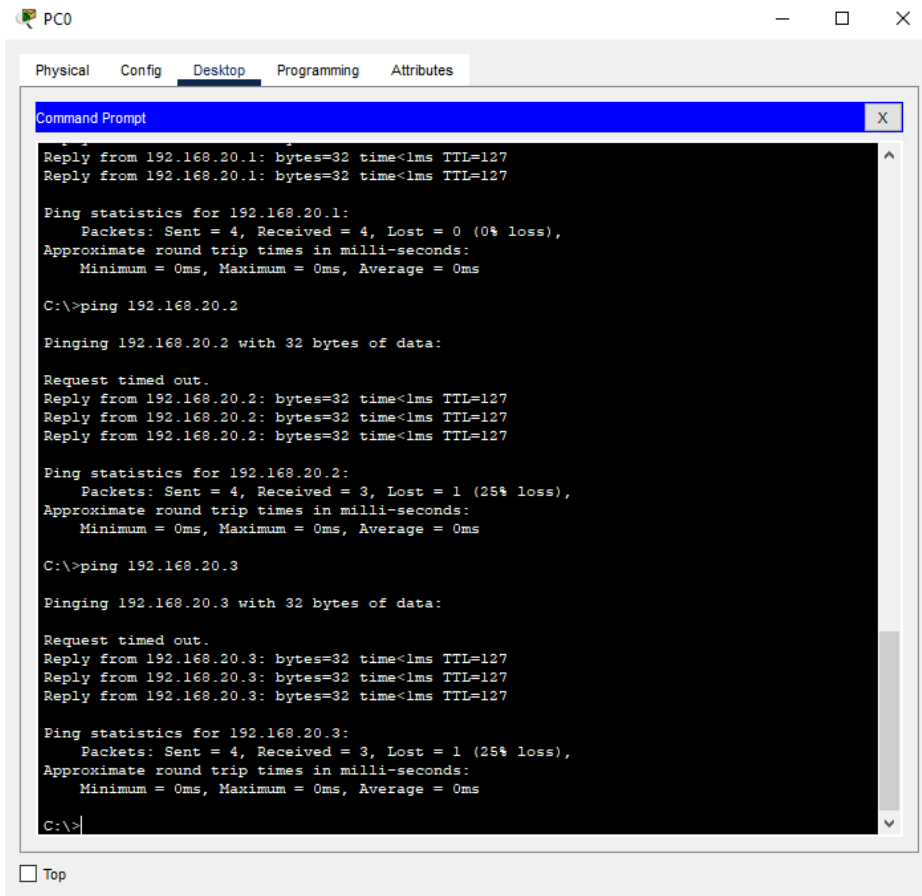
Pinging 192.168.20.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```

PC5 (192.168.20.3)



The screenshot shows a window titled "PC0" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of three ping commands executed from the C:\> directory.

```
C:\>ping 192.168.20.1

Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

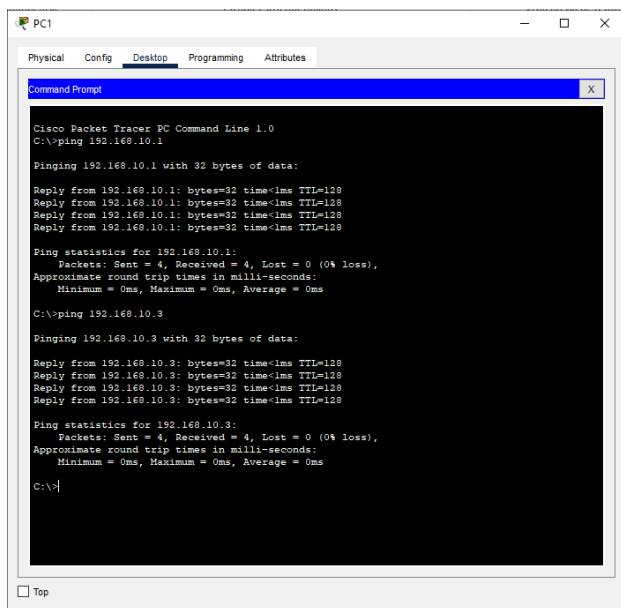
Request timed out.
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

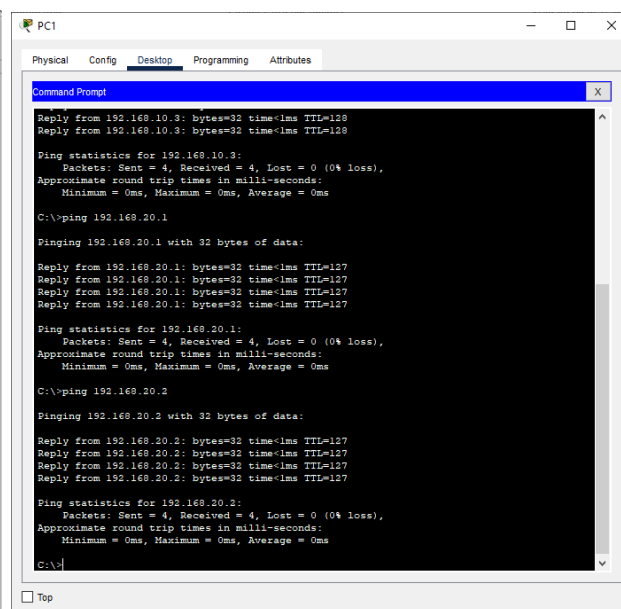
C:\>
```

At the bottom left of the PC0 window, there is a checkbox labeled "Top" which is currently unchecked.

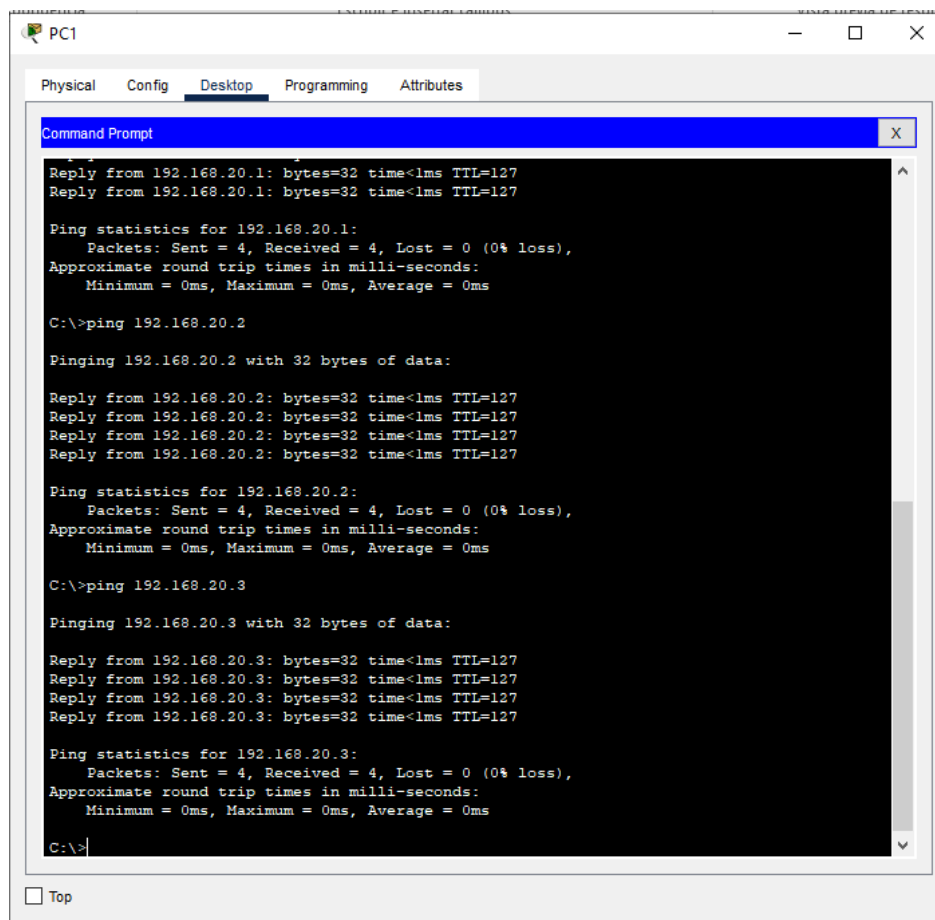
PC2 (192.168.10.3)



PC4 (192.168.20.2)



PC5 (192.168.20.3)



The screenshot shows a PC1 desktop environment with a window titled "PC1". The window has tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of ping commands for three IP addresses: 192.168.20.1, 192.168.20.2, and 192.168.20.3. Each ping command is executed four times, and the results show 0% loss and 0ms round trip times.

```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

☐ Top

Pruebas de Ping desde computadora PC2 (ip 192.168.10.3)

PC0 (192.168.10.1)

PC1 (192.168.10.2)

```

PC2
Physical Config Desktop Programming Attributes
Command Prompt
i - IS-IS, Ia - 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

192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.10.0/24 is directly connected, GigabitEthernet0/0/0
L 192.168.10.254/32 is directly connected, GigabitEthernet0/0/0
C 192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
L 192.168.20.0/24 is directly connected, GigabitEthernet0/0/1
L 192.168.20.254/32 is directly connected, GigabitEthernet0/0/1

R1#
[Connection to 192.168.10.254 closed by foreign host]
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time=2ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>
  
```

```

PC2
Physical Config Desktop Programming Attributes
Command Prompt
[Connection to 192.168.10.254 closed by foreign host]
C:\>
C:\>
C:\>
C:\>
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time=2ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```

PC3 (192.168.20.1)

PC4 (192.168.20.2)

```

PC2
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128
Reply from 192.168.10.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time=4ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 2ms

C:\>
  
```

```

PC2
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time=4ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 2ms

C:\>ping 192.168.20.2

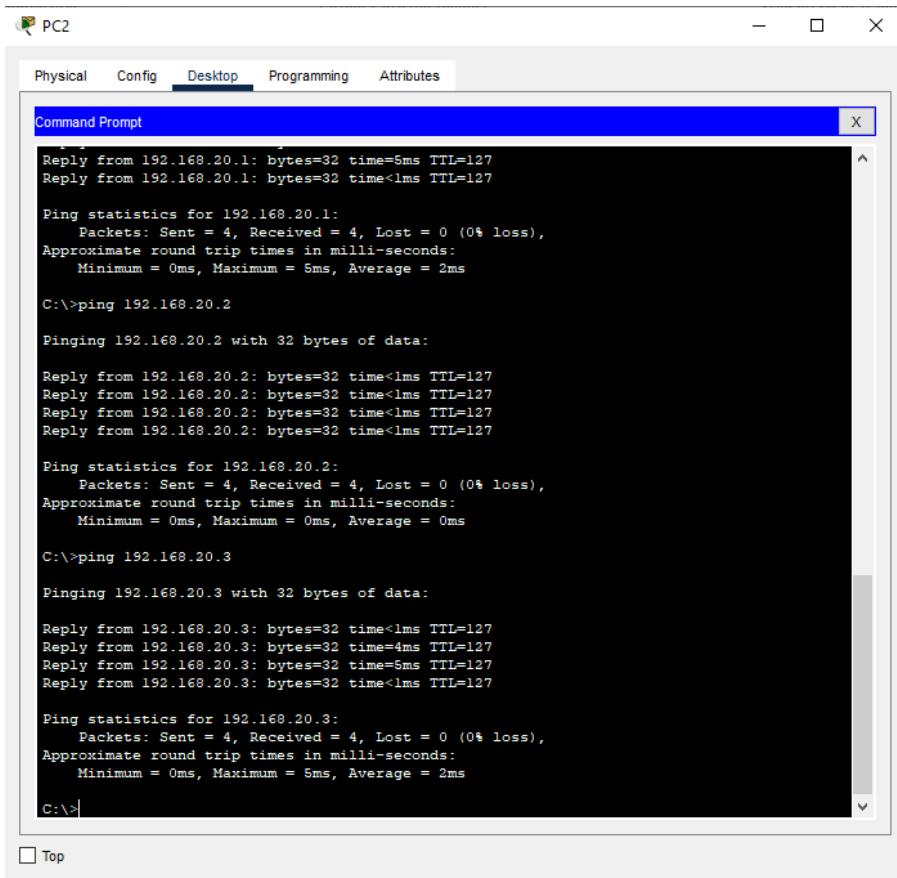
Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
  
```

PC5 (192.168.20.3)



The screenshot shows a window titled "PC2" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of ping commands to three different IP addresses: 192.168.20.1, 192.168.20.2, and 192.168.20.3. Each ping command is followed by four replies and a summary of ping statistics.

```
Reply from 192.168.20.1: bytes=32 time=5ms TTL=127
Reply from 192.168.20.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 2ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127
Reply from 192.168.20.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time<1ms TTL=127
Reply from 192.168.20.3: bytes=32 time=4ms TTL=127
Reply from 192.168.20.3: bytes=32 time=5ms TTL=127
Reply from 192.168.20.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 2ms

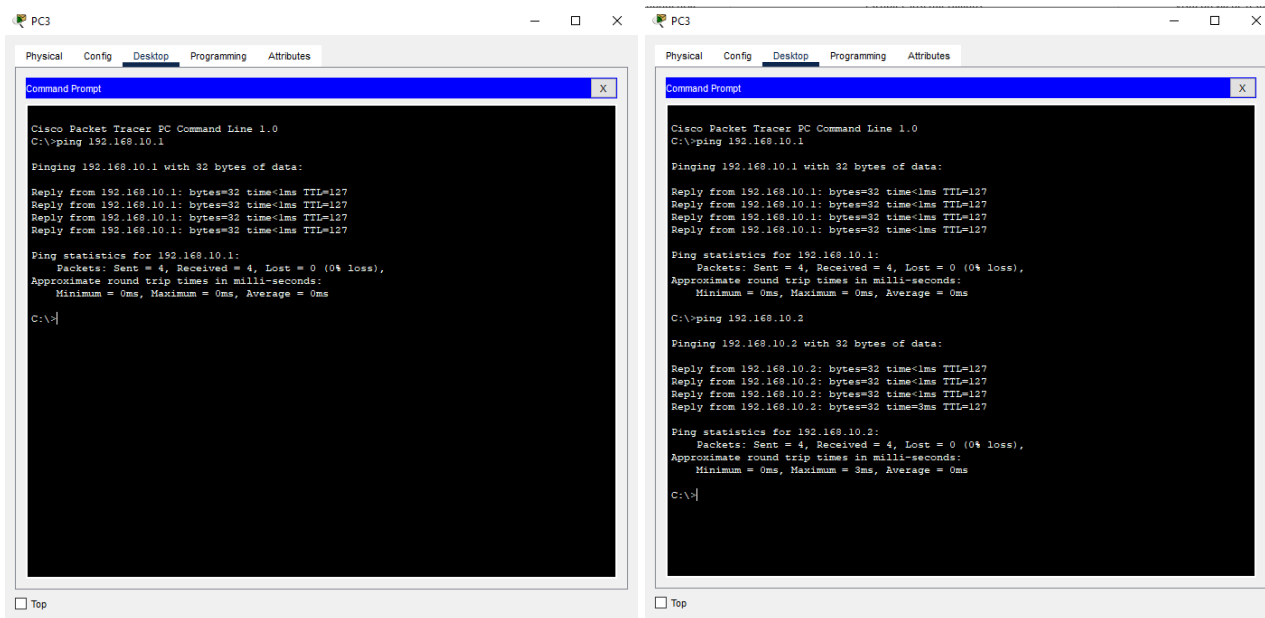
C:\>
```

At the bottom left of the PC2 window, there is a checkbox labeled "Top" which is currently unchecked.

Pruebas de Ping desde computadora PC3 (ip 192.168.20.1)

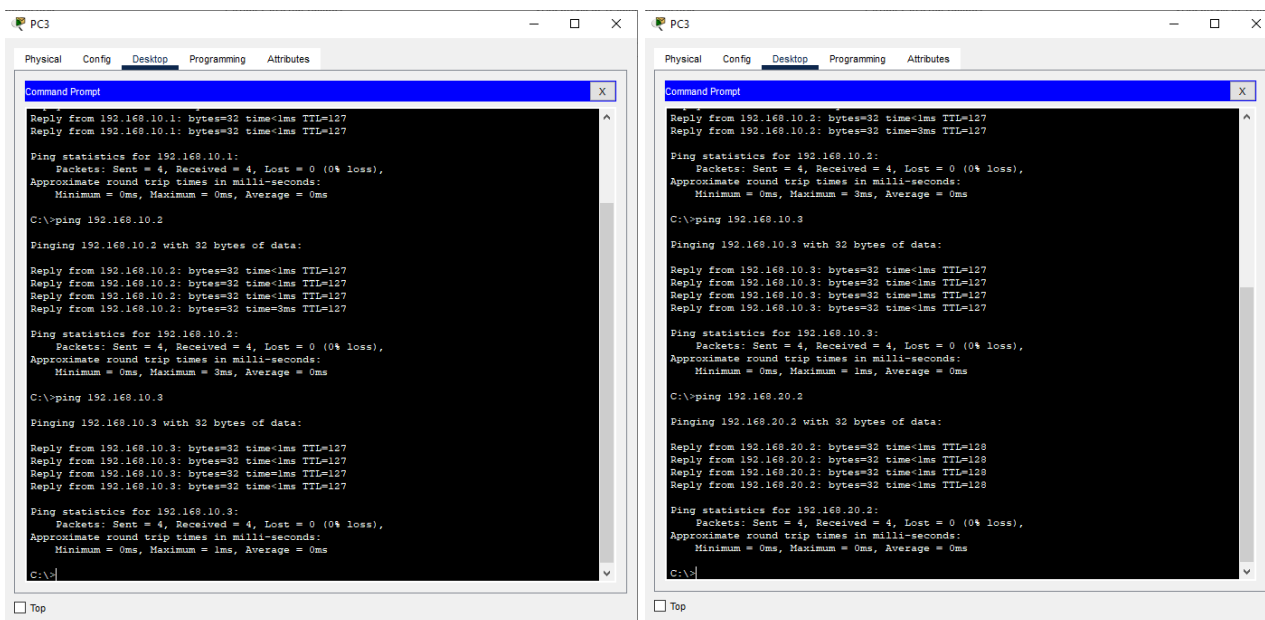
PC0 (192.168.10.1)

PC1 (192.168.10.2)

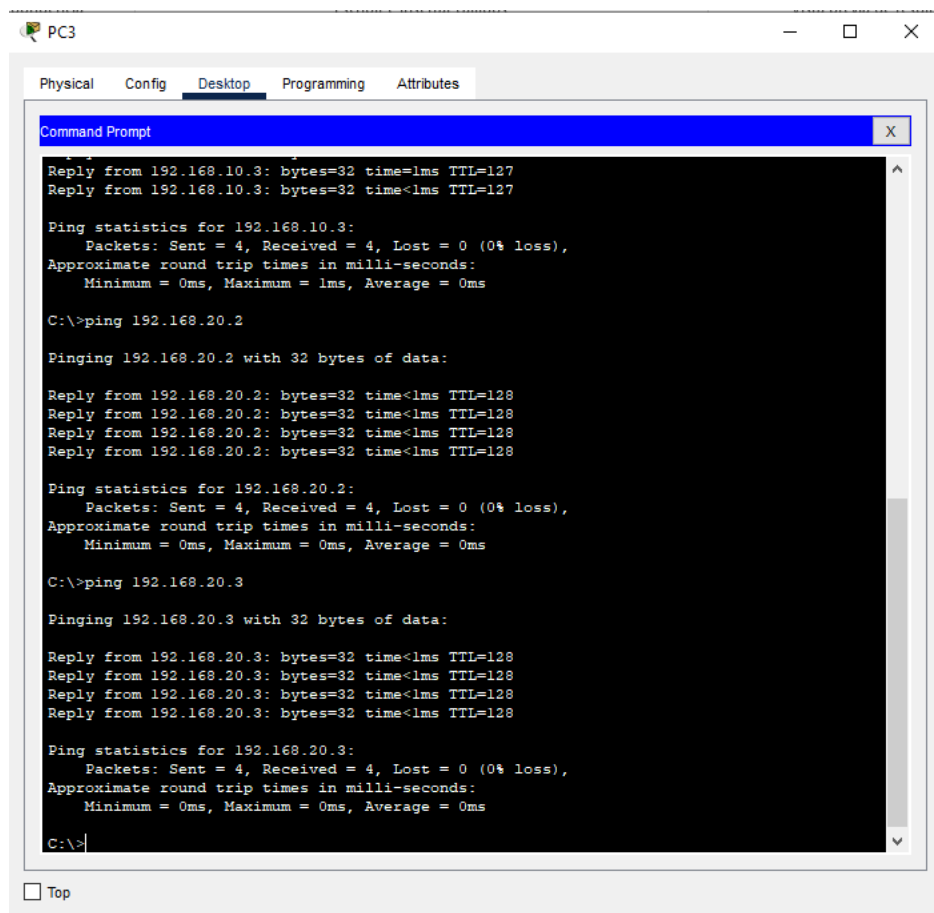


PC2 (192.168.10.3)

PC4 (192.168.20.2)



PC5 (192.168.20.3)



The screenshot shows a window titled "PC3" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of three ping commands. The first command is for 192.168.10.3, showing four successful replies with 32 bytes each, times less than 1ms, and TTL=127. The second command is for 192.168.20.2, showing four successful replies with 32 bytes each, times less than 1ms, and TTL=128. The third command is for 192.168.20.3, showing four successful replies with 32 bytes each, times less than 1ms, and TTL=128. All three commands show 0% loss and 0ms average round trip times.

```
Command Prompt
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time<1ms TTL=128
Reply from 192.168.20.3: bytes=32 time<1ms TTL=128
Reply from 192.168.20.3: bytes=32 time<1ms TTL=128
Reply from 192.168.20.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

☐ Top

Pruebas de Ping desde computadora PC4 (ip 192.168.20.2)

PC0 (192.168.10.1)

PC1 (192.168.10.2)

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

PC2 (192.168.10.3)

PC3 (192.168.20.1)

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

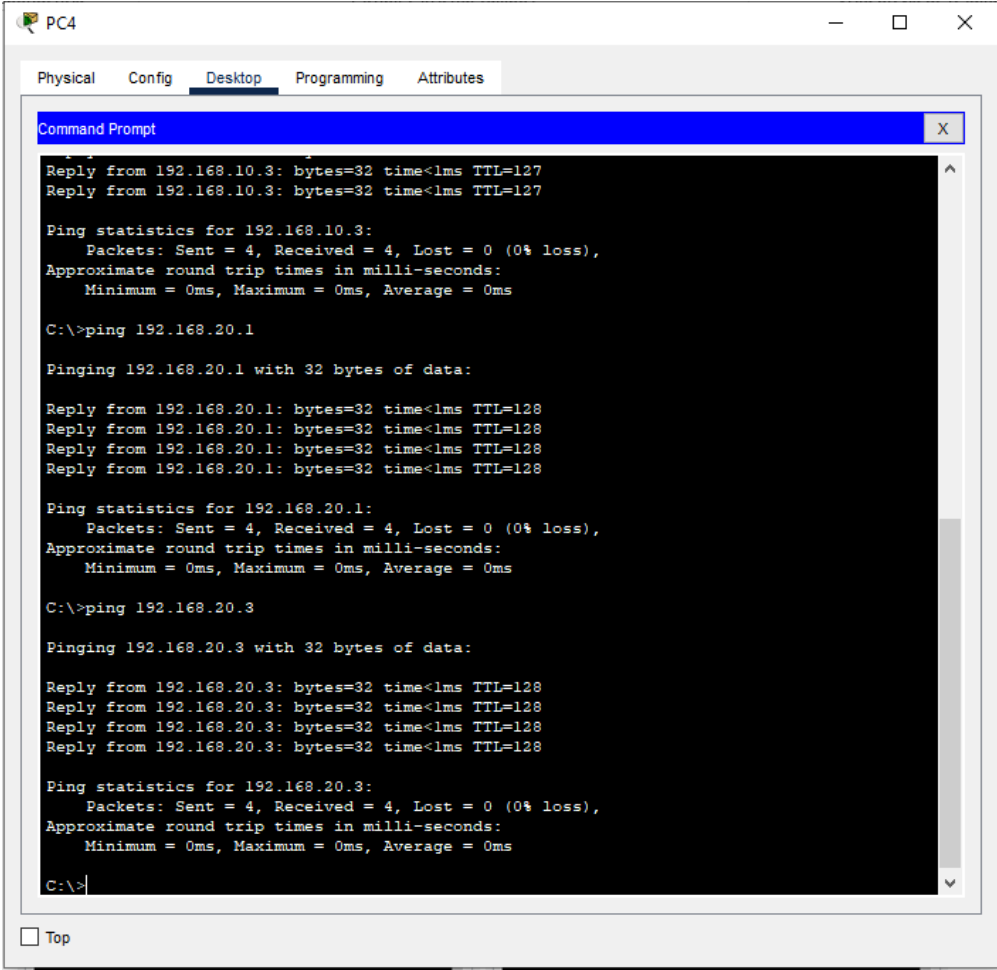
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

PC5 (192.168.20.3)



The screenshot shows a window titled "PC4" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of ping commands to three different IP addresses. The first two pings are to 192.168.10.3, and the last two are to 192.168.20.3. All pings show 0% loss and 0ms round trip times.

```
PC4
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time<1ms TTL=128
Reply from 192.168.20.3: bytes=32 time<1ms TTL=128
Reply from 192.168.20.3: bytes=32 time<1ms TTL=128
Reply from 192.168.20.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

☐ Top

Pruebas de Ping desde computadora PC5 (ip 192.168.20.3)

PC0 (192.168.10.1)

PC1 (192.168.10.2)

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

PC2 (192.168.10.3)

PC3 (192.168.20.1)

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time<1ms TTL=127
Reply from 192.168.10.1: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=127
Reply from 192.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

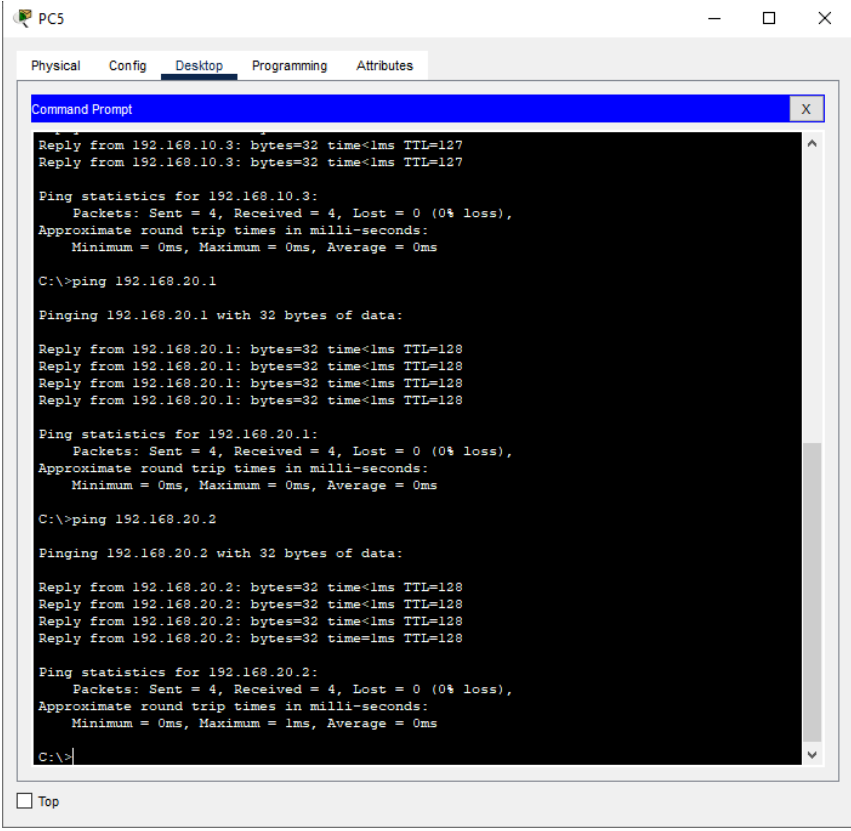
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

```

PC4 (192.168.20.2)



The screenshot shows a window titled "PC5" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of ping commands executed from a host to three different IP addresses: 192.168.10.3, 192.168.20.1, and 192.168.20.2. Each ping command is followed by four replies and a summary of statistics. The statistics for each IP show 4 packets sent, 4 received, 0% loss, and 0ms round trip times (Minimum, Maximum, and Average).

```
PC5
Physical Config Desktop Programming Attributes

Command Prompt
X

Reply from 192.168.10.3: bytes=32 time<1ms TTL=127
Reply from 192.168.10.3: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.1

Pinging 192.168.20.1 with 32 bytes of data:

Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128
Reply from 192.168.20.1: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128
Reply from 192.168.20.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

☐ Top

Conclusión

Este trabajo es la culminación de la materia de Administración de redes y servicios, en el cual se tocó el tema de una red local, las vlan y la utilización de routers para conectar redes locales más grandes y que posiblemente este físicamente alejadas. Estos ejercicios me han sido de muchísima ayuda primero para entender los elementos que conforman una red, como están relacionados y las configuraciones que están o deben estar presentes en ellas para su mejor funcionamiento y seguridad, además es de vital importancia este tema revisado a mi parecer, ya que es una base muy importante que cualquier persona que quiera trabajar en este campo debe conocer, son los conocimientos básicos que se deben tener ya entendidos y aprendidos (sin contar todos los demás conocimientos que se deben tener) para siquiera poder aspirar a poder trabajar en este ramo empresarial.

Profesor muchísimas gracias por todo su apoyo y sus increíbles clases, espero poder tener otras materias más con usted para seguir aprendiendo y participando.

Este trabajo fue subido al siguiente enlace de GitHub

<https://github.com/CarlosNico/Administraci-ndeRedesyServidores>

Referencias

(N.d.). Cloudflare.com. Retrieved November 19, 2024, from <https://www.cloudflare.com/es-es/learning/network-layer/what-is-a-router/>