

02 - Enrutamiento Estático

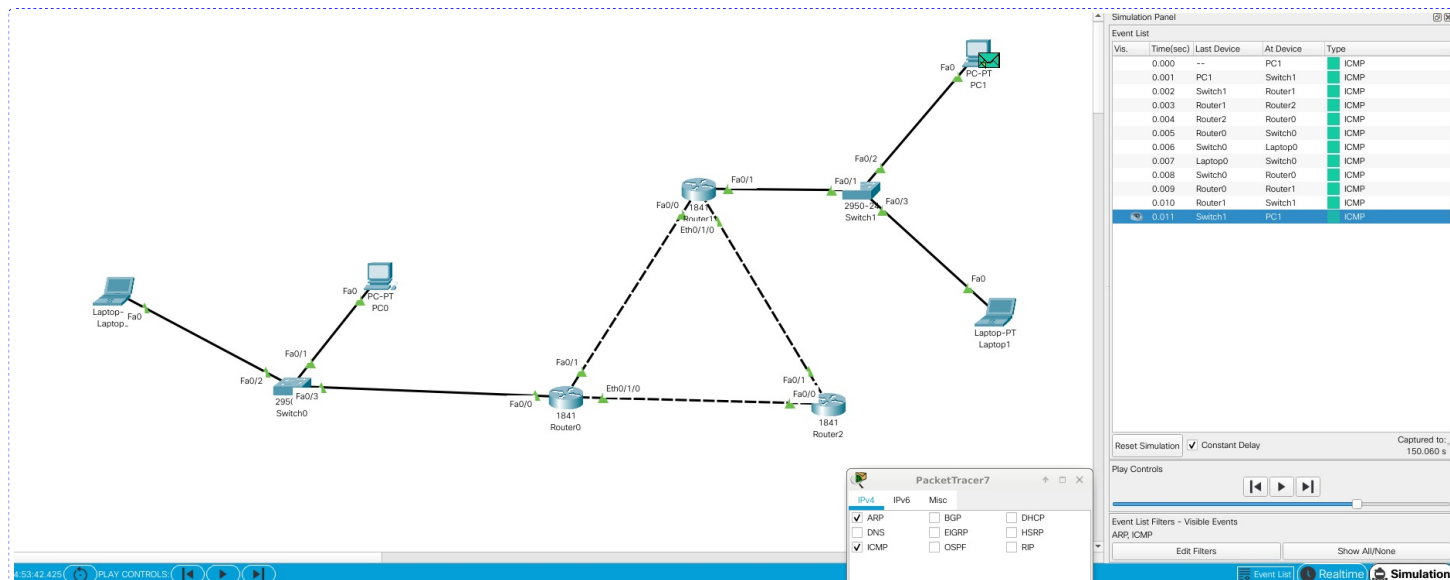


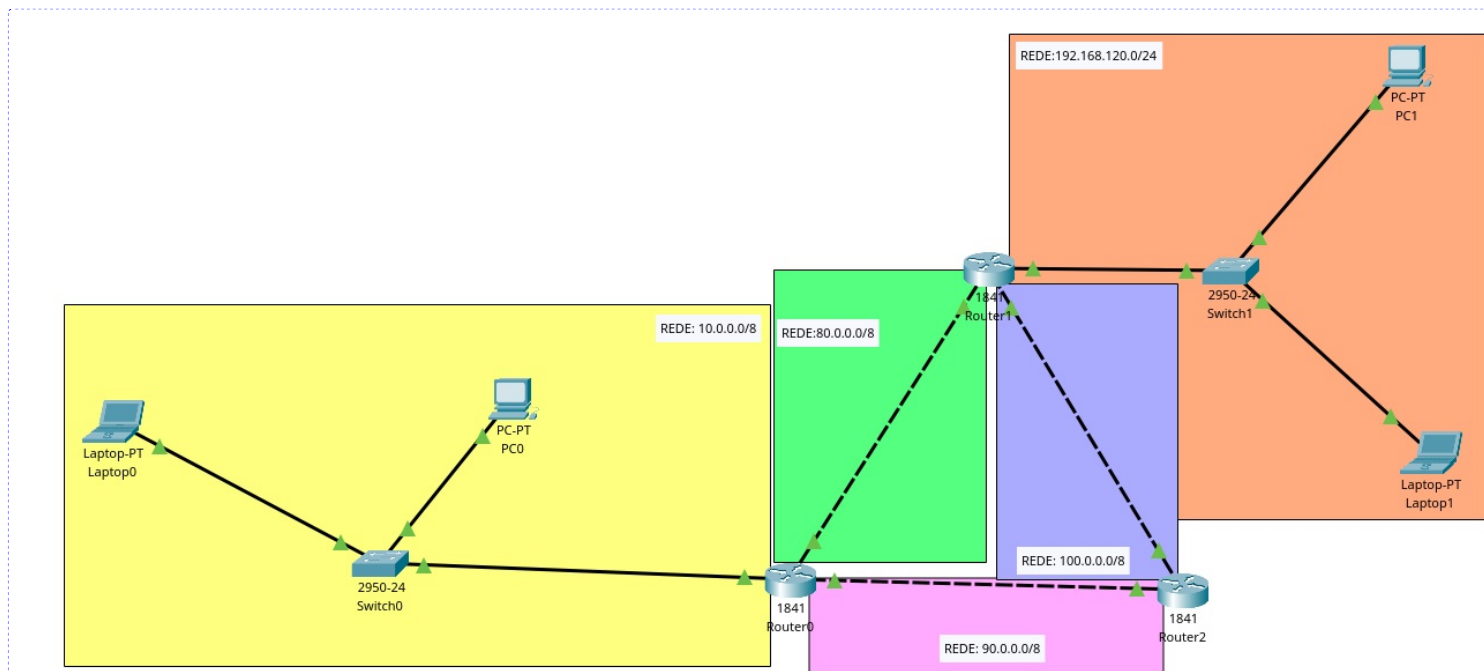
Fig.1 - Enrutamiento Estático

NOTAS:

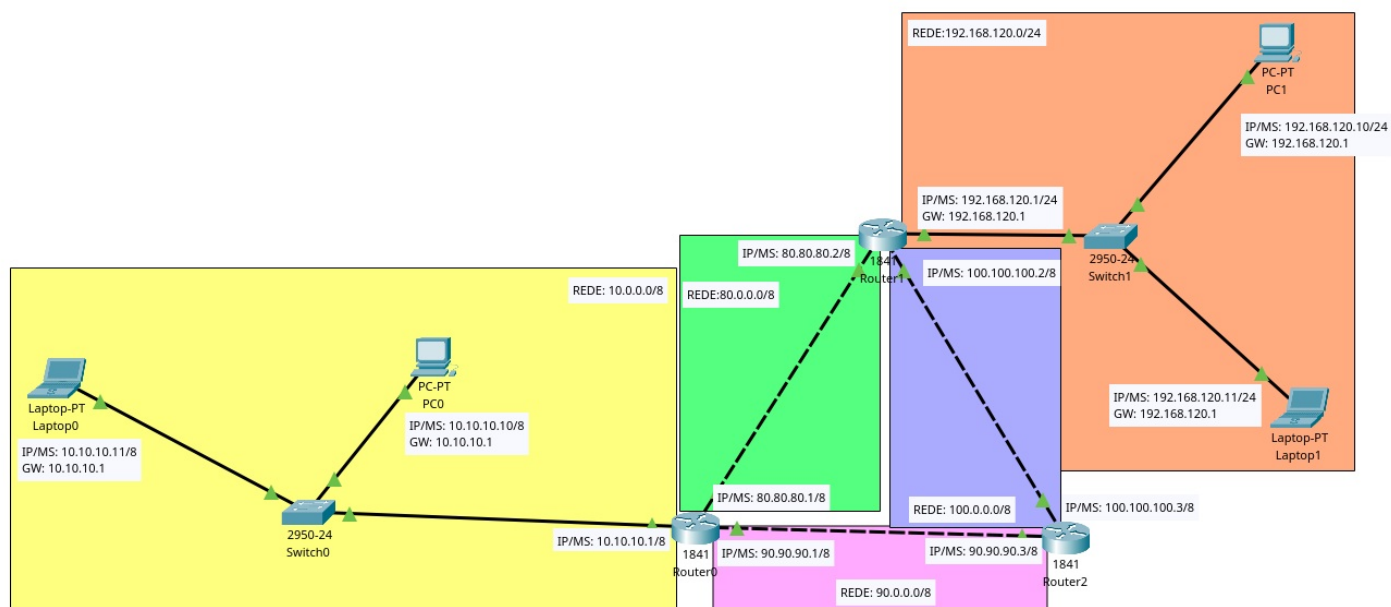
- (1) Archivo a descargar e abrir en Cisco Packet Tracer: [Enrutamiento-Estatico-2-BRS.pkt](#)
- (2) O diagrama representa 2 oficinas dunha empresa.
- (3) IP=IPv4, MS=Máscara de Subrede, GW=Gateway, DR=Dirección de Rede.

Cisco Packet Tracer

1. Carga o diagrama da Fig.1 no Cisco Packet Tracer, é dicir, abre o arquivo descargado (ver NOTAS) no Cisco Packet Tracer.
2. Identifica mediante rectángulos de cores os segmentos de redes existentes no diagrama.



3. Representa no diagrama a topoloxía lóxica (IP/MS/GW/DR).



4. A continuación, por cada apartado realiza mediante comandos un ping de 10 paquetes ICMP indicando que é o que acontece (Razoa a resposta):

- a. Do PC1 á IP 127.0.0.1 → ping -n 10 127.0.0.1 → Existe conectividade debido a que a dirección 127.0.0.1 pertence ao rango de direccións de loopback, que se empregan para probar e verificar a pila de rede do propio dispositivo local. A dirección 127.0.0.1, especificamente, sempre apunta á máquina local na que se executa o comando.

```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping /?
Cisco Packet Tracer PC Ping

Usage: ping [-n count | -v TOS | -t ] target

C:\>ping -n 10 127.0.0.1

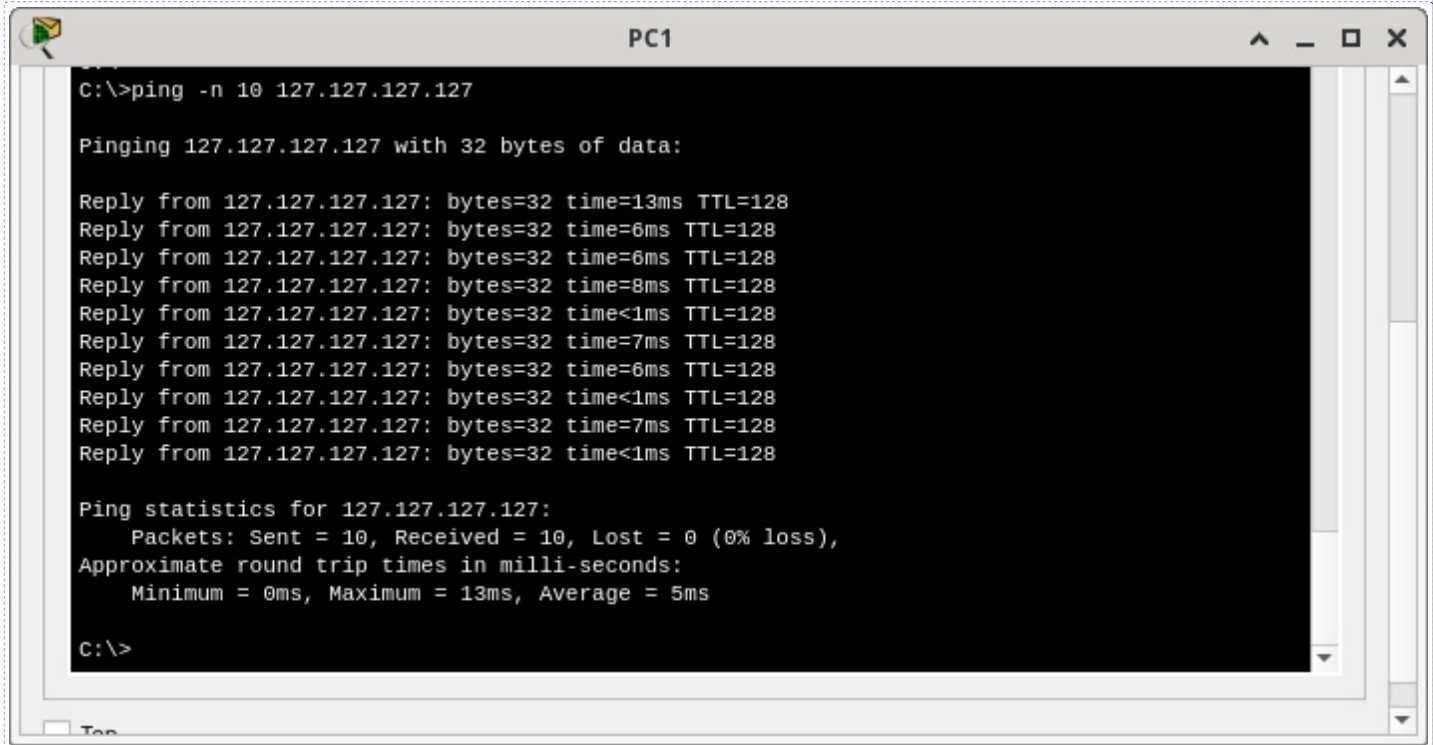
Pinging 127.0.0.1 with 32 bytes of data:

Reply from 127.0.0.1: bytes=32 time=14ms TTL=128
Reply from 127.0.0.1: bytes=32 time=6ms TTL=128
Reply from 127.0.0.1: bytes=32 time=7ms TTL=128
Reply from 127.0.0.1: bytes=32 time=6ms TTL=128
Reply from 127.0.0.1: bytes=32 time=6ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time=6ms TTL=128
Reply from 127.0.0.1: bytes=32 time=7ms TTL=128
Reply from 127.0.0.1: bytes=32 time=6ms TTL=128
Reply from 127.0.0.1: bytes=32 time=6ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 14ms, Average = 6ms

C:\>
```

- b. Do PC1 á IP 127.127.127.127 → ping -n 10 127.127.127.127 → Existe conectividade xa que todos os enderezos do intervalo 127.0.0.0/8 (de 127.0.0.1 a 127.255.255.254) están reservados para a funcionalidade de loopback. Isto significa que, como ocorre con 127.0.0.1, os paquetes enviados a 127.127.127.127 non abandonarán o dispositivo e procesaranse localmente.



```
C:\>ping -n 10 127.127.127.127

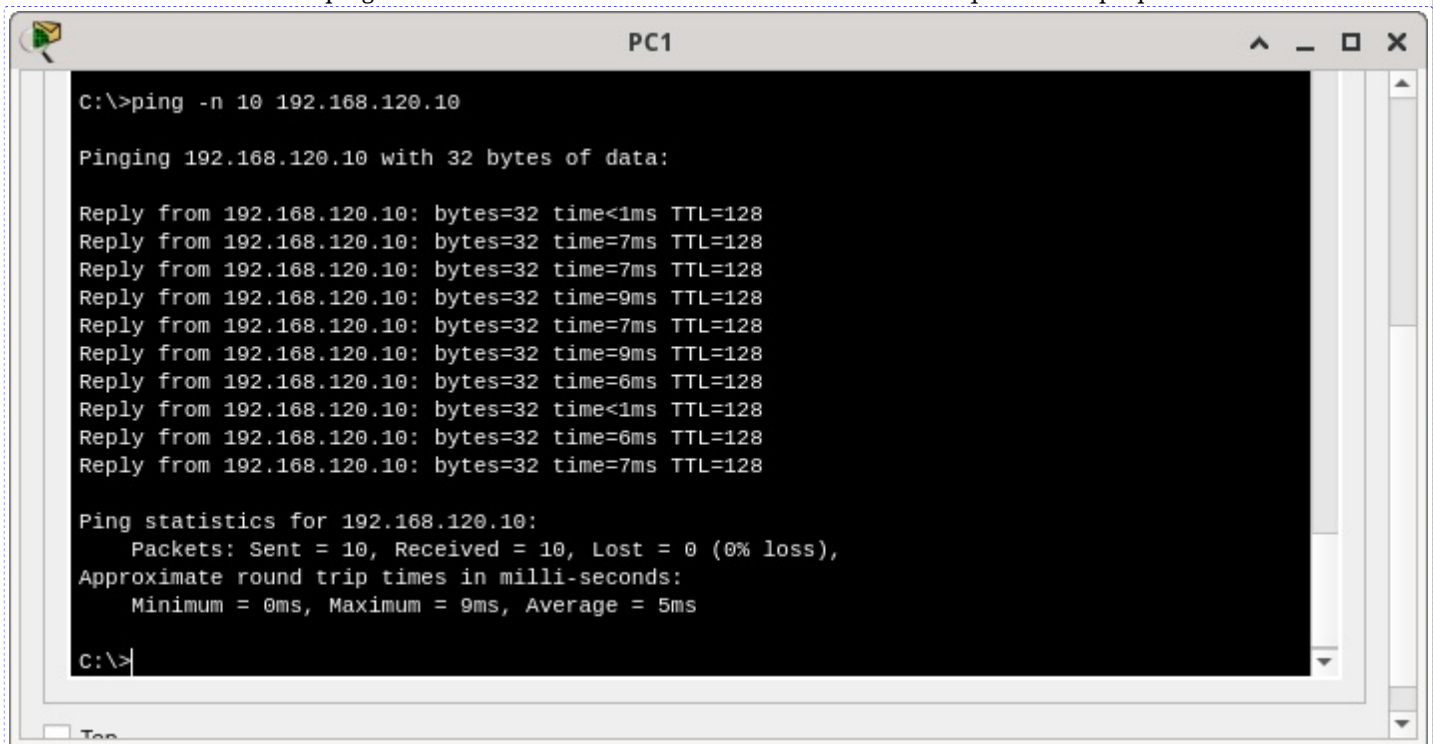
Pinging 127.127.127.127 with 32 bytes of data:

Reply from 127.127.127.127: bytes=32 time=13ms TTL=128
Reply from 127.127.127.127: bytes=32 time=6ms TTL=128
Reply from 127.127.127.127: bytes=32 time=6ms TTL=128
Reply from 127.127.127.127: bytes=32 time=8ms TTL=128
Reply from 127.127.127.127: bytes=32 time<1ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time=6ms TTL=128
Reply from 127.127.127.127: bytes=32 time<1ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time<1ms TTL=128

Ping statistics for 127.127.127.127:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 13ms, Average = 5ms

C:\>
```

- c. Do PC1 á IP 192.168.120.10 → ping -n 10 192.168.120.10 → Existe conectividade debido a que esta é a propia dirección IP de PC1.



```
C:\>ping -n 10 192.168.120.10

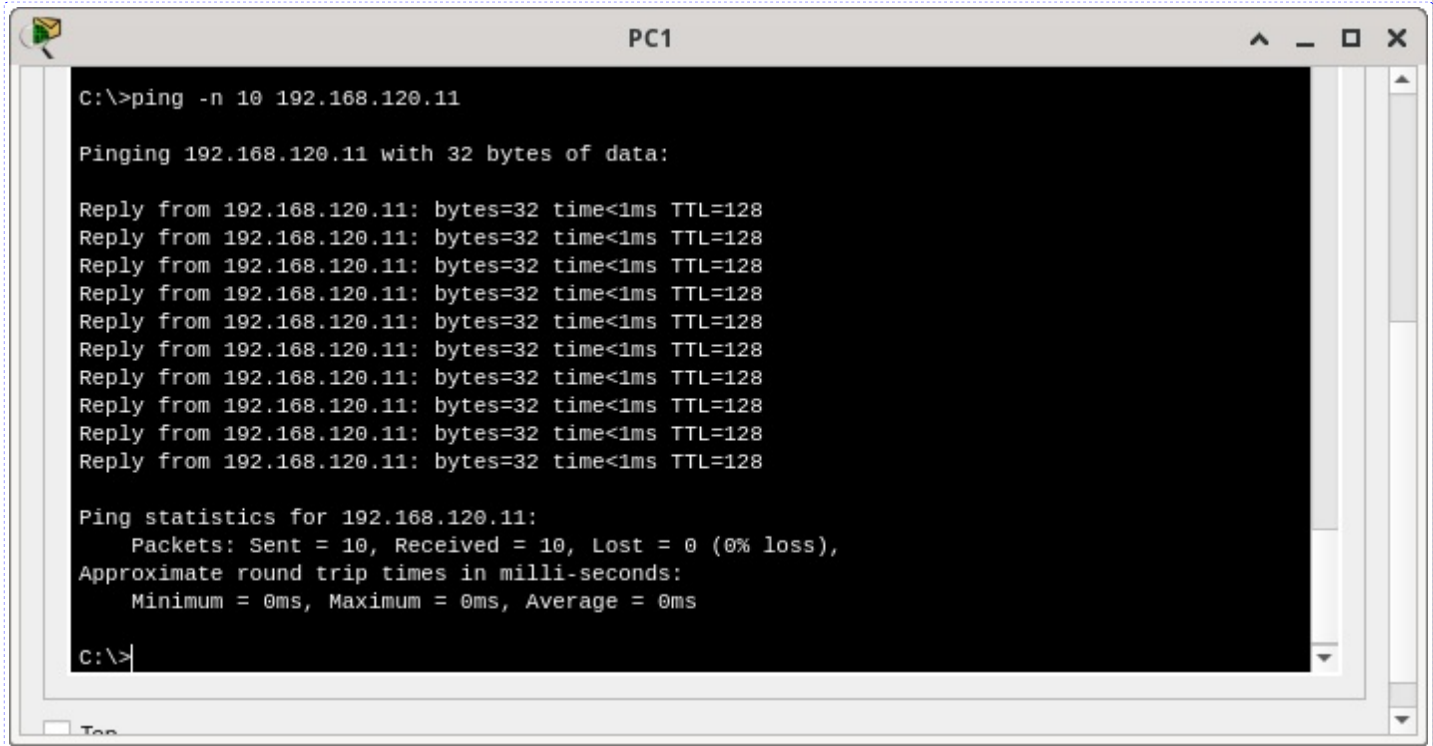
Pinging 192.168.120.10 with 32 bytes of data:

Reply from 192.168.120.10: bytes=32 time<1ms TTL=128
Reply from 192.168.120.10: bytes=32 time=7ms TTL=128
Reply from 192.168.120.10: bytes=32 time=7ms TTL=128
Reply from 192.168.120.10: bytes=32 time=9ms TTL=128
Reply from 192.168.120.10: bytes=32 time=7ms TTL=128
Reply from 192.168.120.10: bytes=32 time=9ms TTL=128
Reply from 192.168.120.10: bytes=32 time=6ms TTL=128
Reply from 192.168.120.10: bytes=32 time<1ms TTL=128
Reply from 192.168.120.10: bytes=32 time=6ms TTL=128
Reply from 192.168.120.10: bytes=32 time=7ms TTL=128

Ping statistics for 192.168.120.10:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 9ms, Average = 5ms

C:\>
```

- d. Do PC1 á IP 192.168.120.11 → ping -n 10 192.168.120.11 → Existe conectividade debido a que os 2 equipos pertencen á mesma rede e o cableado e a electrónica de rede así o permite.



```
C:\>ping -n 10 192.168.120.11

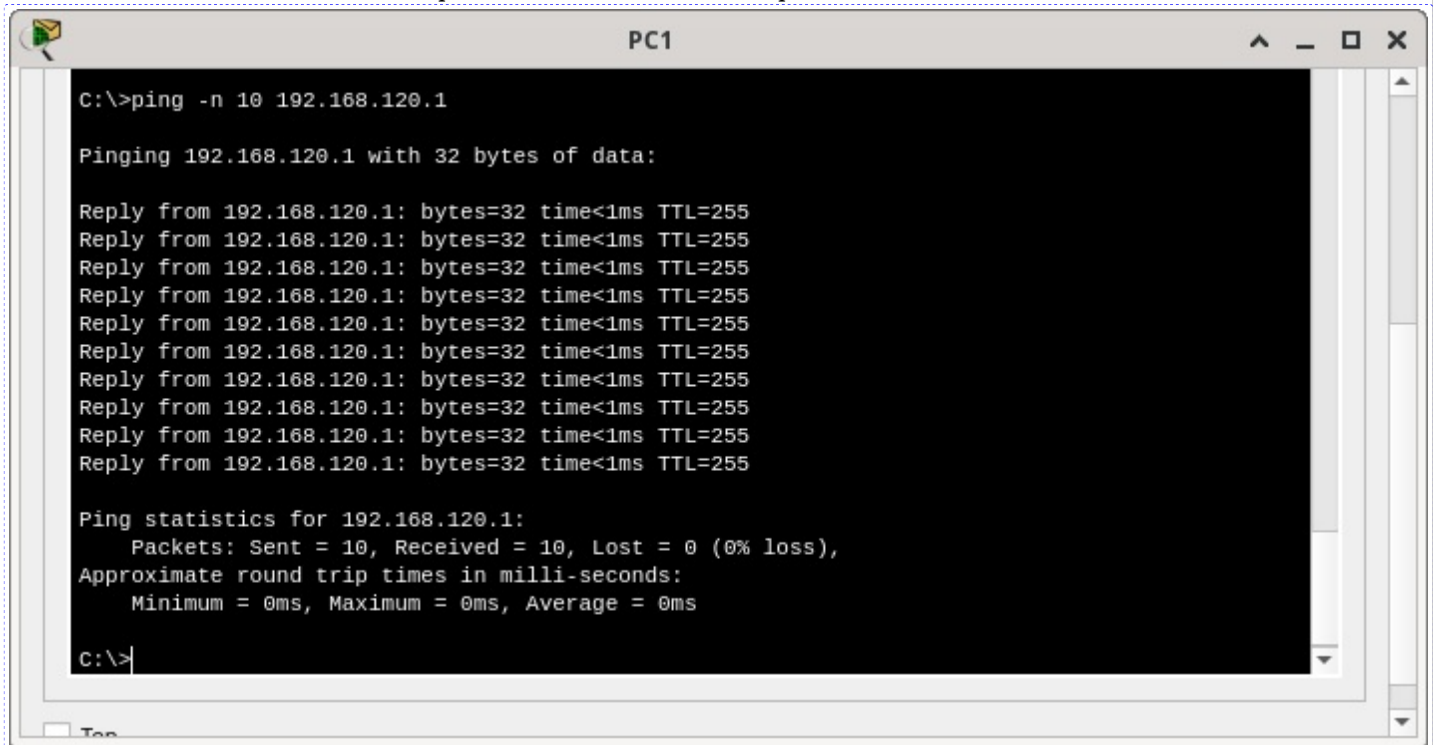
Pinging 192.168.120.11 with 32 bytes of data:

Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128
Reply from 192.168.120.11: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.120.11:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- e. Do PC1 á IP 192.168.120.1 → ping -n 10 192.168.120.1 → Existe conectividade debido a que os 2 equipos pertencen á mesma rede e o cableado e a electrónica de rede así o permite. A IP 192.168.120.1 é a porta de enlace de PC1.



```
C:\>ping -n 10 192.168.120.1

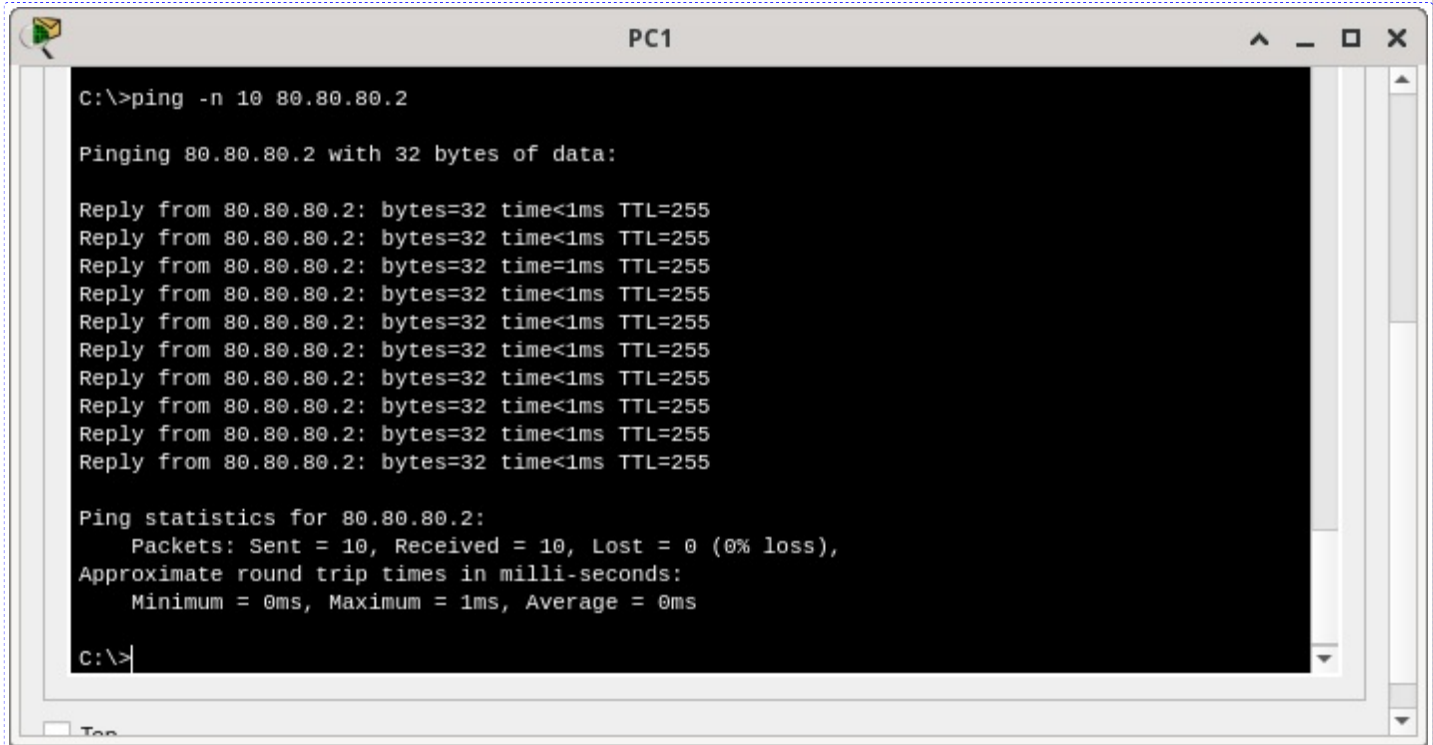
Pinging 192.168.120.1 with 32 bytes of data:

Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255
Reply from 192.168.120.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.120.1:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- f. Do PC1 á IP 80.80.80.2 → ping -n 10 80.80.80.2 → Existe conectividade porque o PC1 ten configurado correctamente o gateway predeterminado (192.168.120.1), que corresponde á interface FastEthernet 0/1 do router. Cando o PC1 envía un ping a 80.80.80.2, o tráfico é dirixido ao gateway, que reenvía os paquetes a través da súa interface FastEthernet 0/0 coa IP 80.80.80.2. Este router actúa como un intermediario entre as dúas redes, permitindo a comunicación ao estar configurado correctamente coas súas interfaces en ambas redes (a 192.168.120.0/24 e a 80.0.0.0/8).



```
C:\>ping -n 10 80.80.80.2

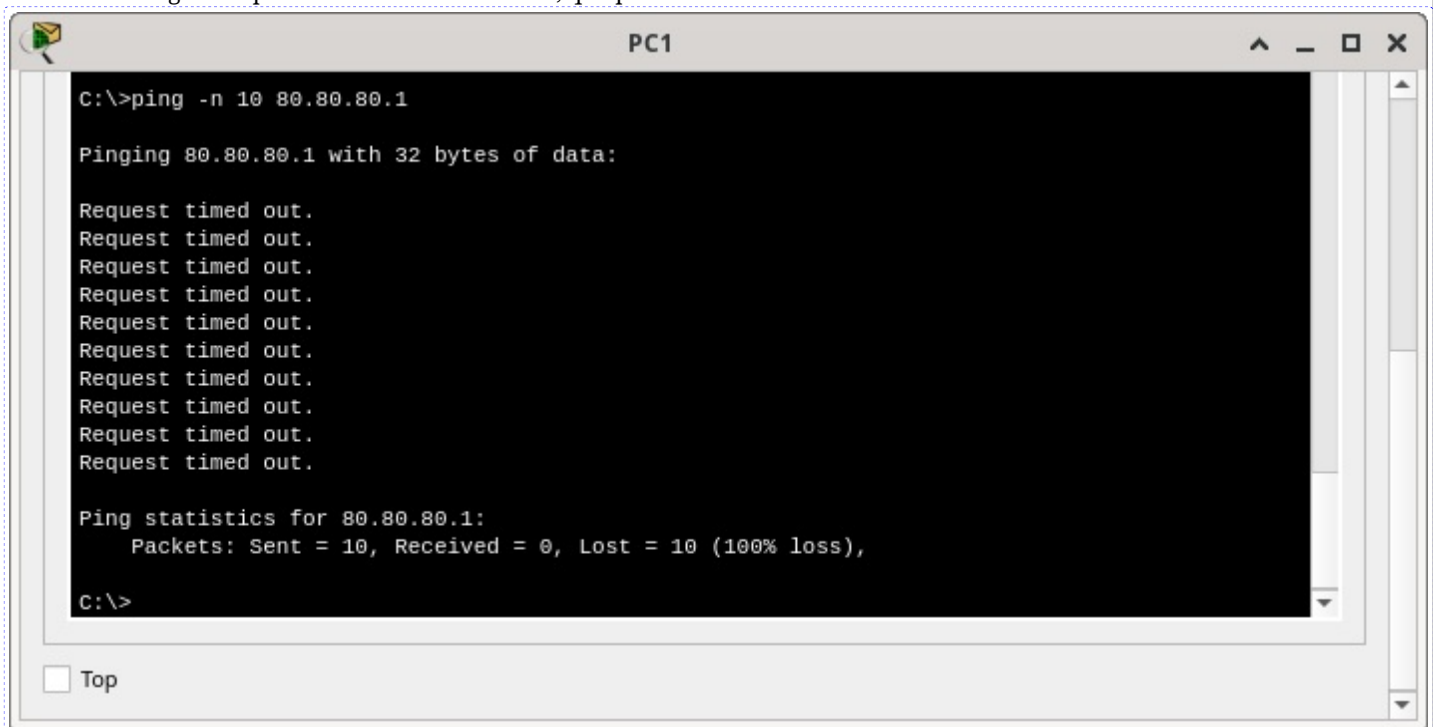
Pinging 80.80.80.2 with 32 bytes of data:

Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255
Reply from 80.80.80.2: bytes=32 time<1ms TTL=255

Ping statistics for 80.80.80.2:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- g. Do PC1 á IP 80.80.80.1 → ping -n 10 80.80.80.1 → Non existe conectividade porque o Router1 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router0.



```
C:\>ping -n 10 80.80.80.1

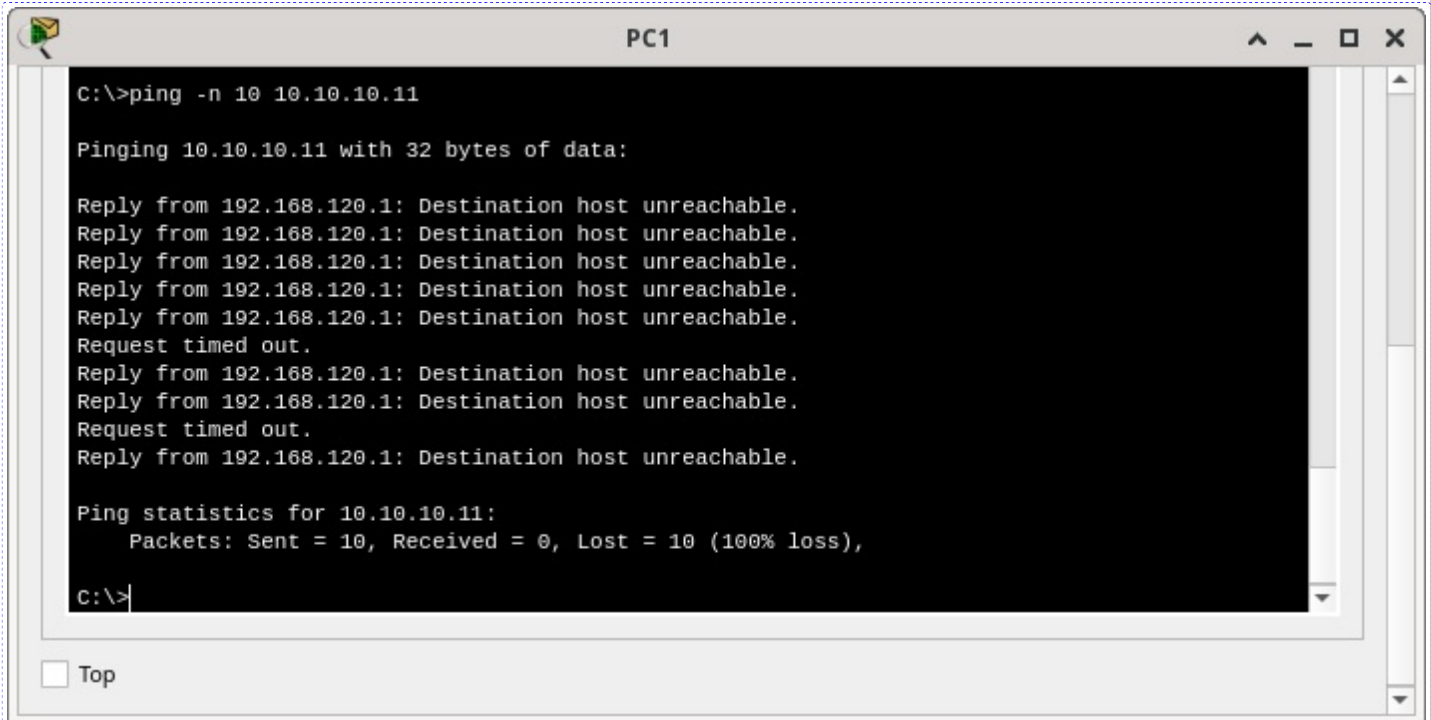
Pinging 80.80.80.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 80.80.80.1:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

- h. Do PC1 á IP 100.100.100.2 → ping -n 10 100.100.100.2 → Existe conectividade porque o PC1 ten configurado correctamente o gateway predeterminado (192.168.120.1), que corresponde á interface FastEthernet 0/1 do router. Cando o PC1 envía un ping a 100.100.100.2, o tráfico é dirixido ao gateway, que reenvía os paquetes a través da súa interface Ethernet 0/1/0 coa IP 100.100.100.2. Este router actúa como un intermediario entre as dúas redes, permitindo a comunicación ao estar configurado correctamente coas súas interfaces en ambas redes (a 192.168.120.0/24 e a 100.0.0.0/8).



The screenshot shows a Windows Command Prompt window titled "PC1". The user has entered the command "C:\>ping -n 10 10.10.10.11". The output shows that the ping is successful, with replies from 192.168.120.1. The ping statistics show 10 packets sent, 10 received, and 0 lost (0% loss).

```
C:\>ping -n 10 10.10.10.11

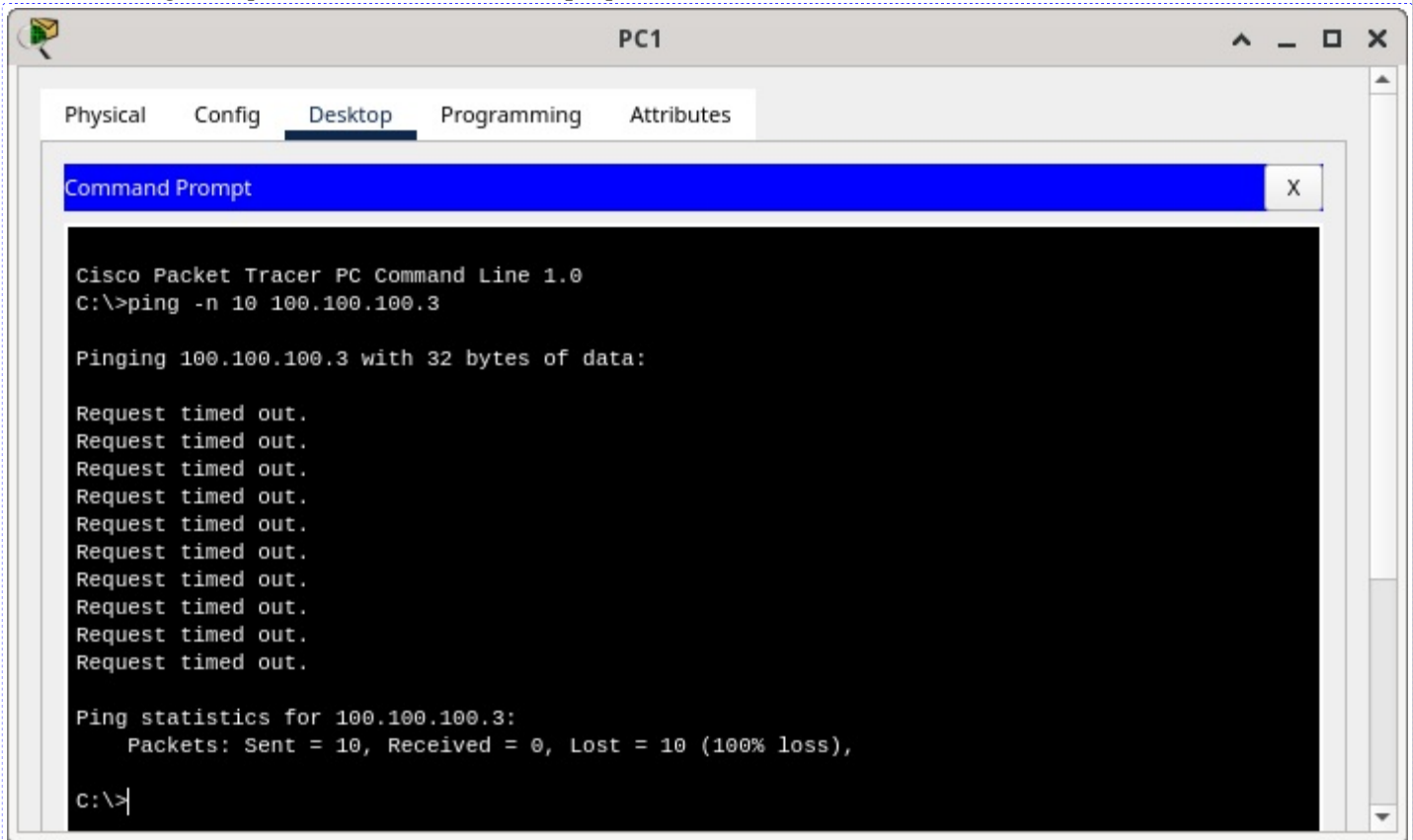
Pinging 10.10.10.11 with 32 bytes of data:

Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Request timed out.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Request timed out.
Reply from 192.168.120.1: Destination host unreachable.

Ping statistics for 10.10.10.11:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

- i. Do PC1 á IP 100.100.100.3 → ping -n 10 100.100.100.3 → Non existe conectividade porque o Router1 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router2.



The screenshot shows a Cisco Packet Tracer PC Command Line window titled "PC1". The user has entered the command "C:\>ping -n 10 100.100.100.3". The output shows that the ping is failed, with request timed out. The ping statistics show 10 packets sent, 0 received, and 10 lost (100% loss).

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping -n 10 100.100.100.3

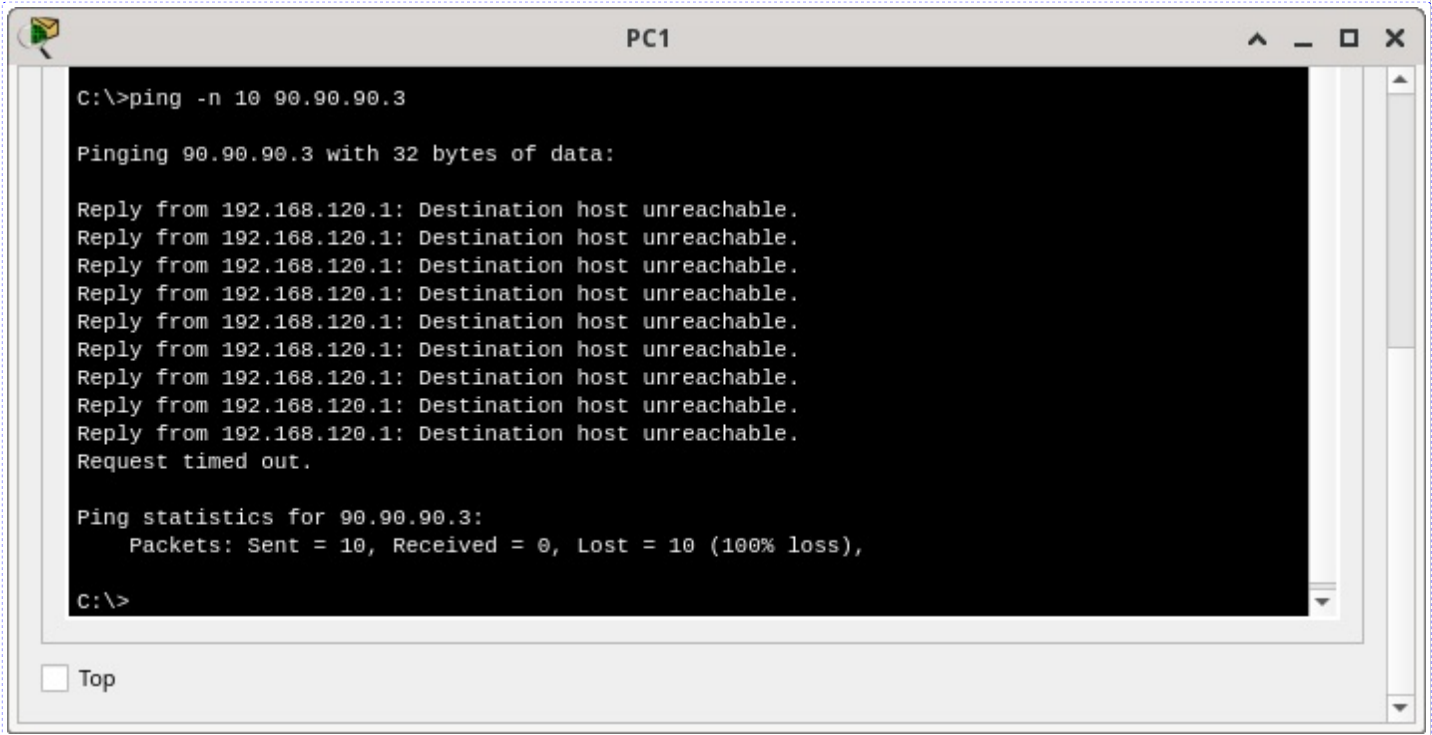
Pinging 100.100.100.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 100.100.100.3:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```


- j. Do PC1 á IP 90.90.90.3 → ping -n 10 90.90.90.3 → Non existe conectividade porque o Router1 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router2.



```
C:\>ping -n 10 90.90.90.3

Pinging 90.90.90.3 with 32 bytes of data:

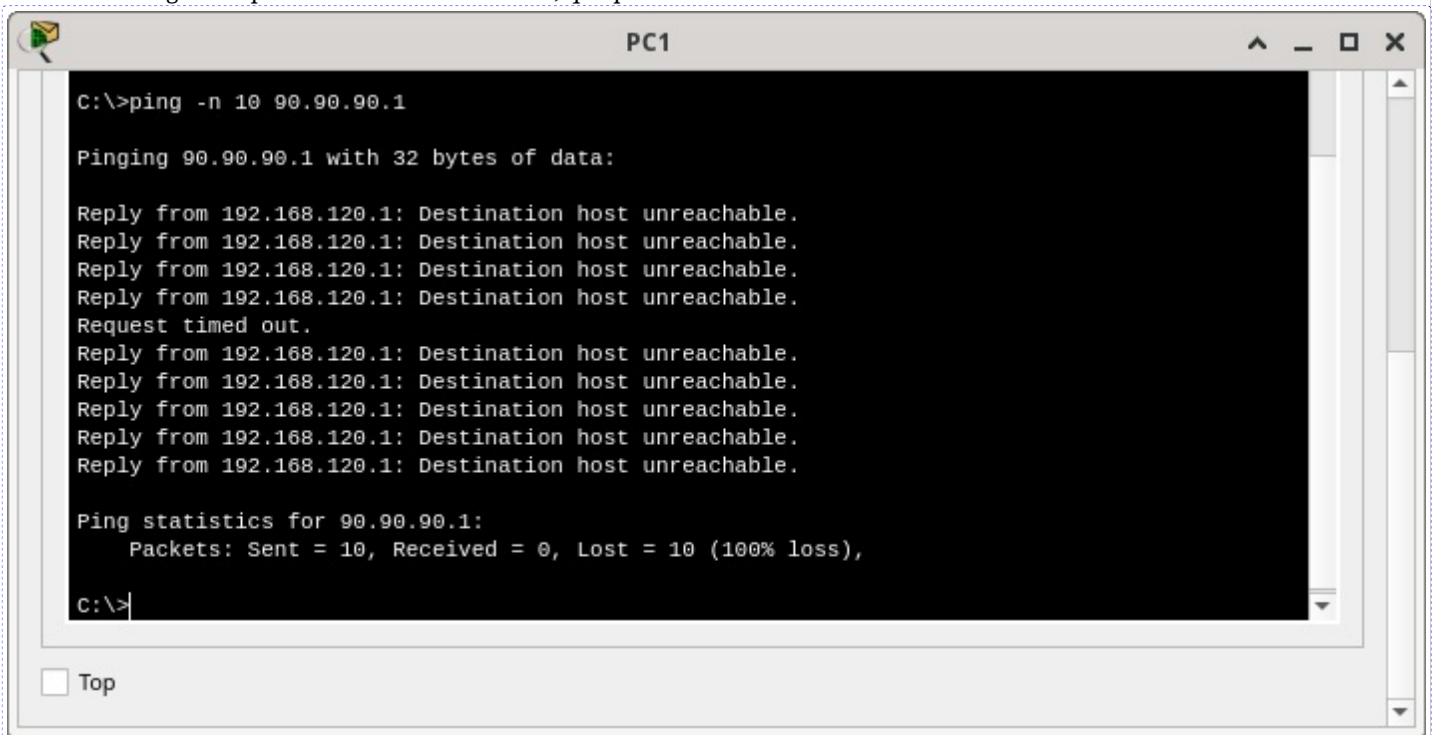
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Request timed out.

Ping statistics for 90.90.90.3:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

☐ Top

- k. Do PC1 á IP 90.90.90.1 → ping -n 10 90.90.90.1 → Non existe conectividade porque o Router1 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router0.



```
C:\>ping -n 10 90.90.90.1

Pinging 90.90.90.1 with 32 bytes of data:

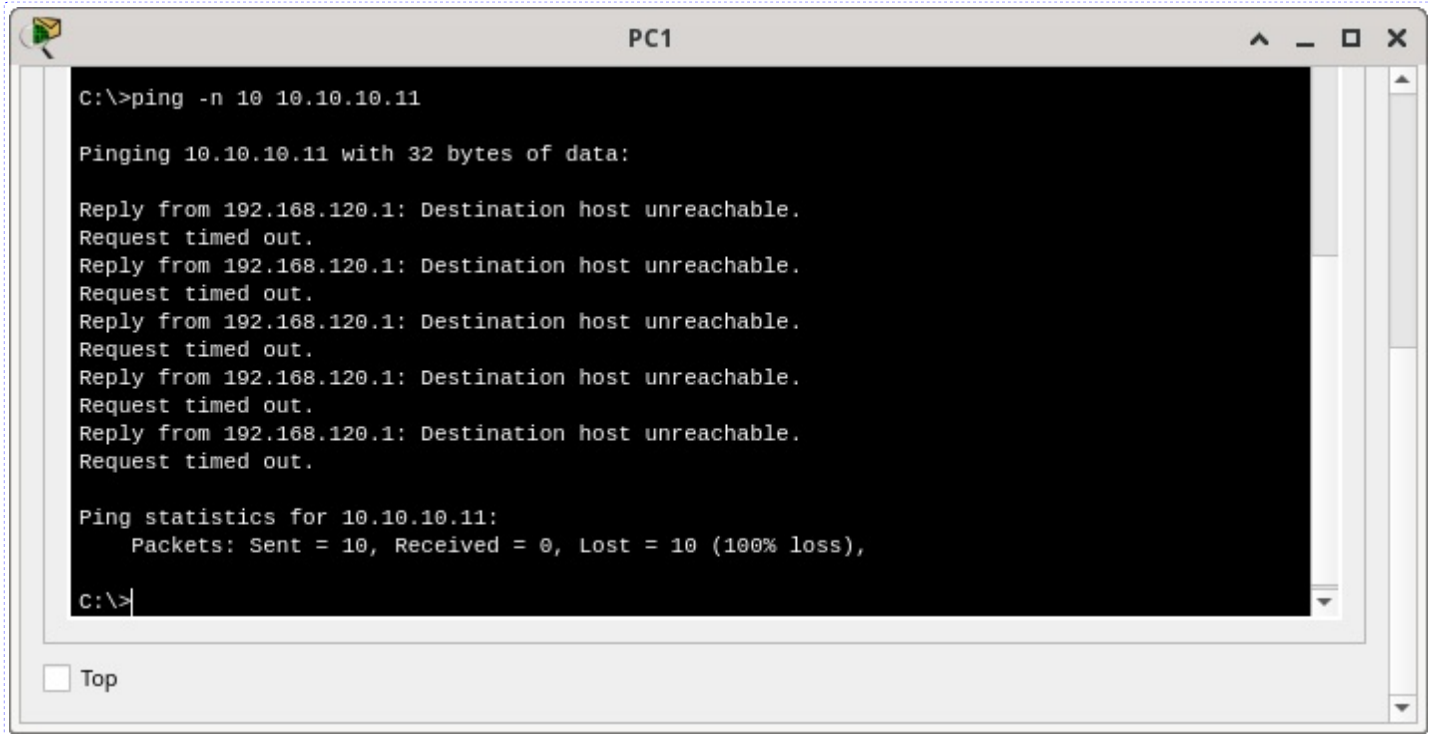
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Request timed out.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.
Reply from 192.168.120.1: Destination host unreachable.

Ping statistics for 90.90.90.1:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

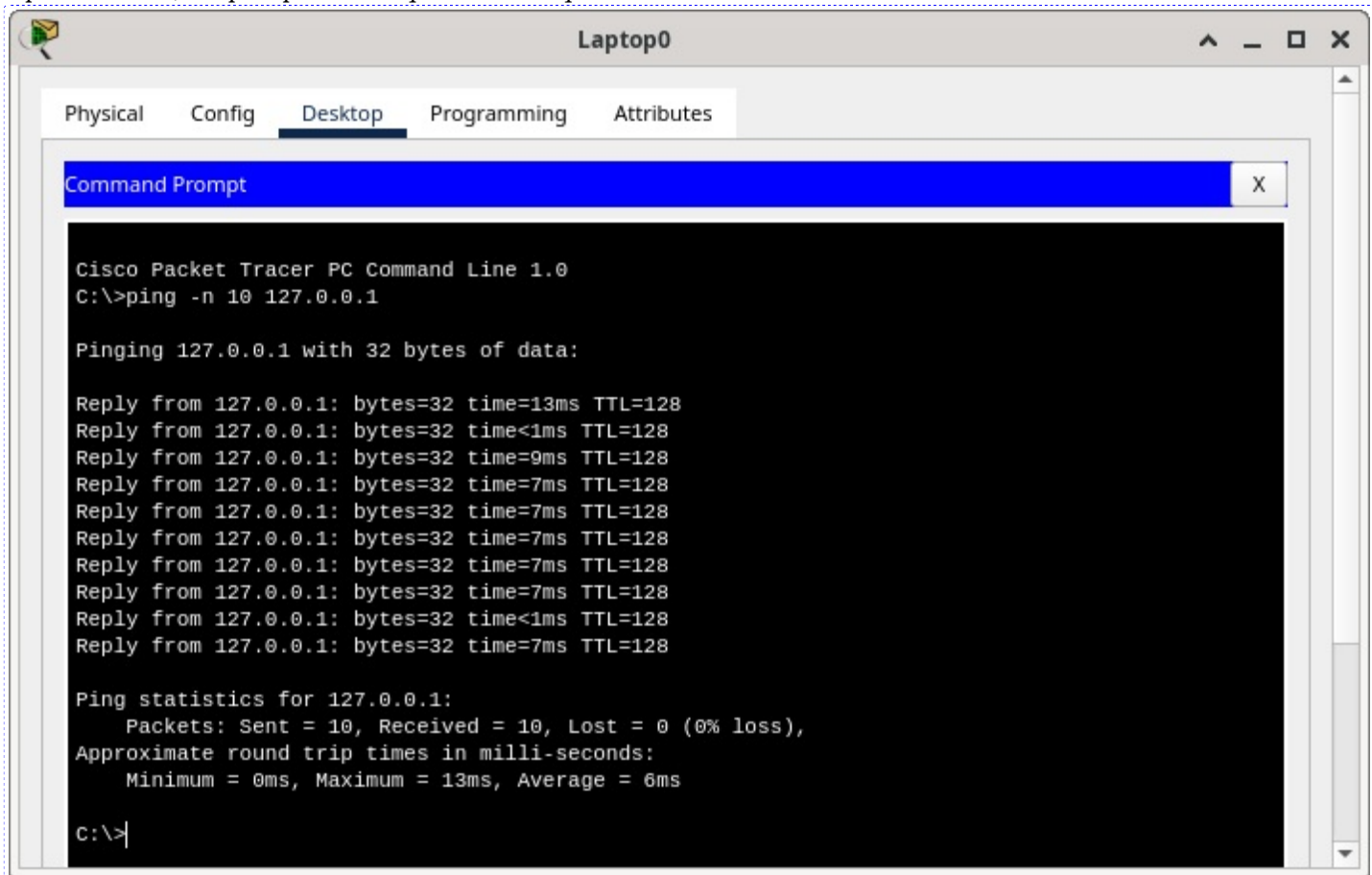
☐ Top

1. Do PC1 á IP 10.10.10.11 → ping -n 10 10.10.10.11 → Non existe conectividade xa que os paquetes ICMP non son quen de chegar ao Router0, polo que xa non son capaz de chegar ao Laptop0.

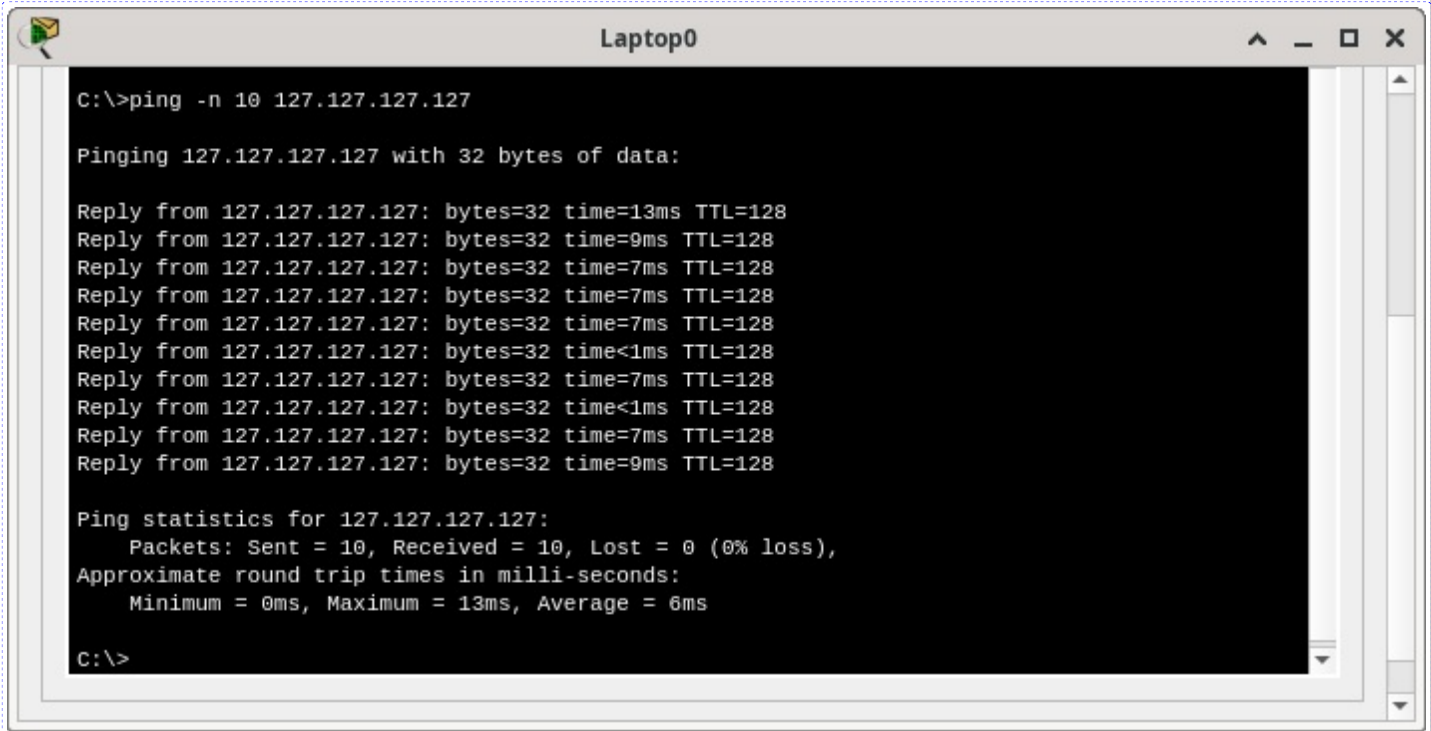


5. A continuación, por cada apartado realiza mediante comandos un ping de 10 paquetes ICMP indicando que é o que acontece (Razoa a resposta):

- a. Do Laptop0 á IP 127.0.0.1 → ping -n 10 127.0.0.1 → Existe conectividade debido a que a dirección 127.0.0.1 pertence ao rango de direccións de loopback, que se empregan para probar e verificar a pila de rede do propio dispositivo local. A dirección 127.0.0.1, especificamente, sempre apunta á máquina local na que se executa o comando.



- b. Do Laptop0 á IP 127.127.127.127 → ping -n 10 127.127.127.127 → Existe conectividade xa que todos os enderezos do intervalo 127.0.0.0/8 (de 127.0.0.1 a 127.255.255.254) están reservados para a funcionalidade de loopback. Isto significa que, como ocorre con 127.0.0.1, os paquetes enviados a 127.127.127.127 non abandonarán o dispositivo e procesaranse localmente.



```
C:\>ping -n 10 127.127.127.127

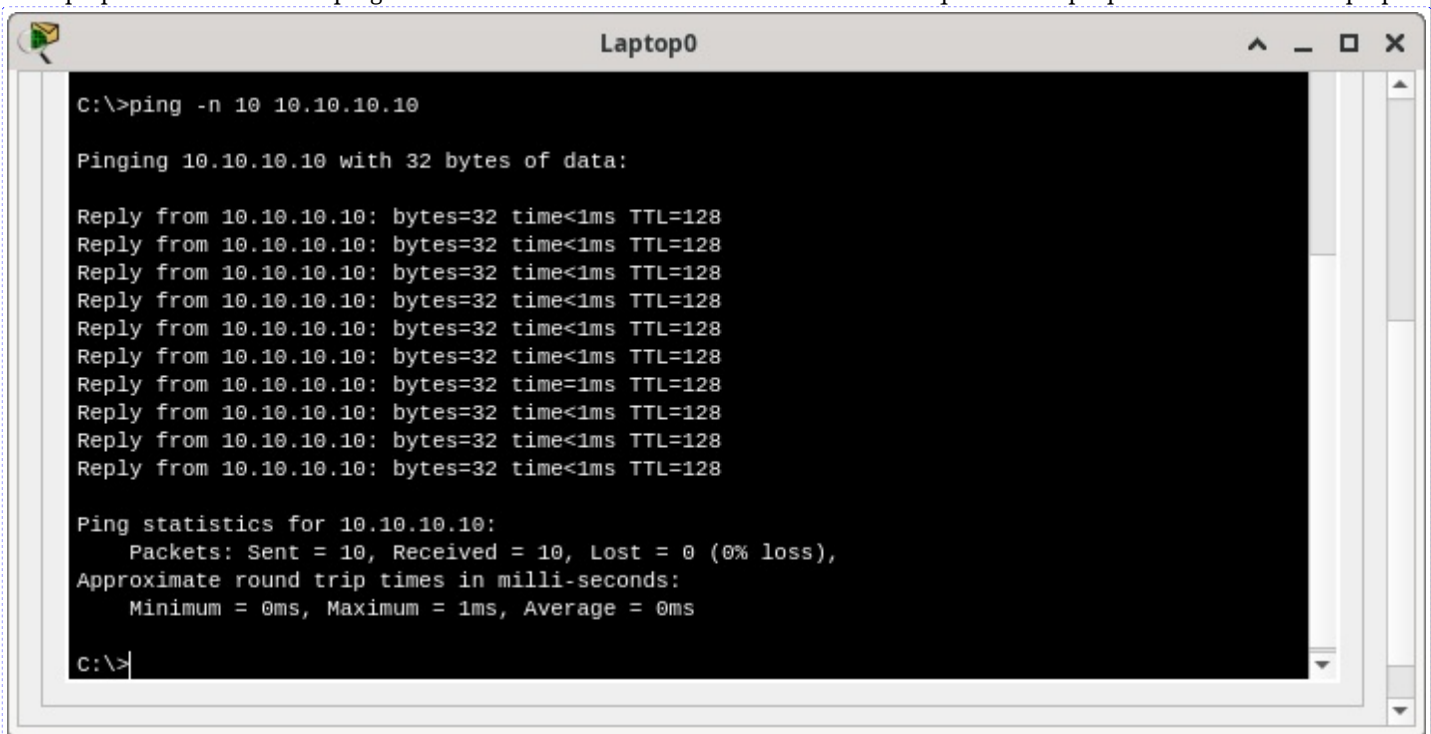
Pinging 127.127.127.127 with 32 bytes of data:

Reply from 127.127.127.127: bytes=32 time=13ms TTL=128
Reply from 127.127.127.127: bytes=32 time=9ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time<1ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time<1ms TTL=128
Reply from 127.127.127.127: bytes=32 time=7ms TTL=128
Reply from 127.127.127.127: bytes=32 time=9ms TTL=128

Ping statistics for 127.127.127.127:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 13ms, Average = 6ms

C:\>
```

- c. Do Laptop0 á IP 10.10.10.10 → ping -n 10 10.10.10.10 → Existe conectividade debido a que esta é a propia dirección IP de Laptop0.



```
C:\>ping -n 10 10.10.10.10

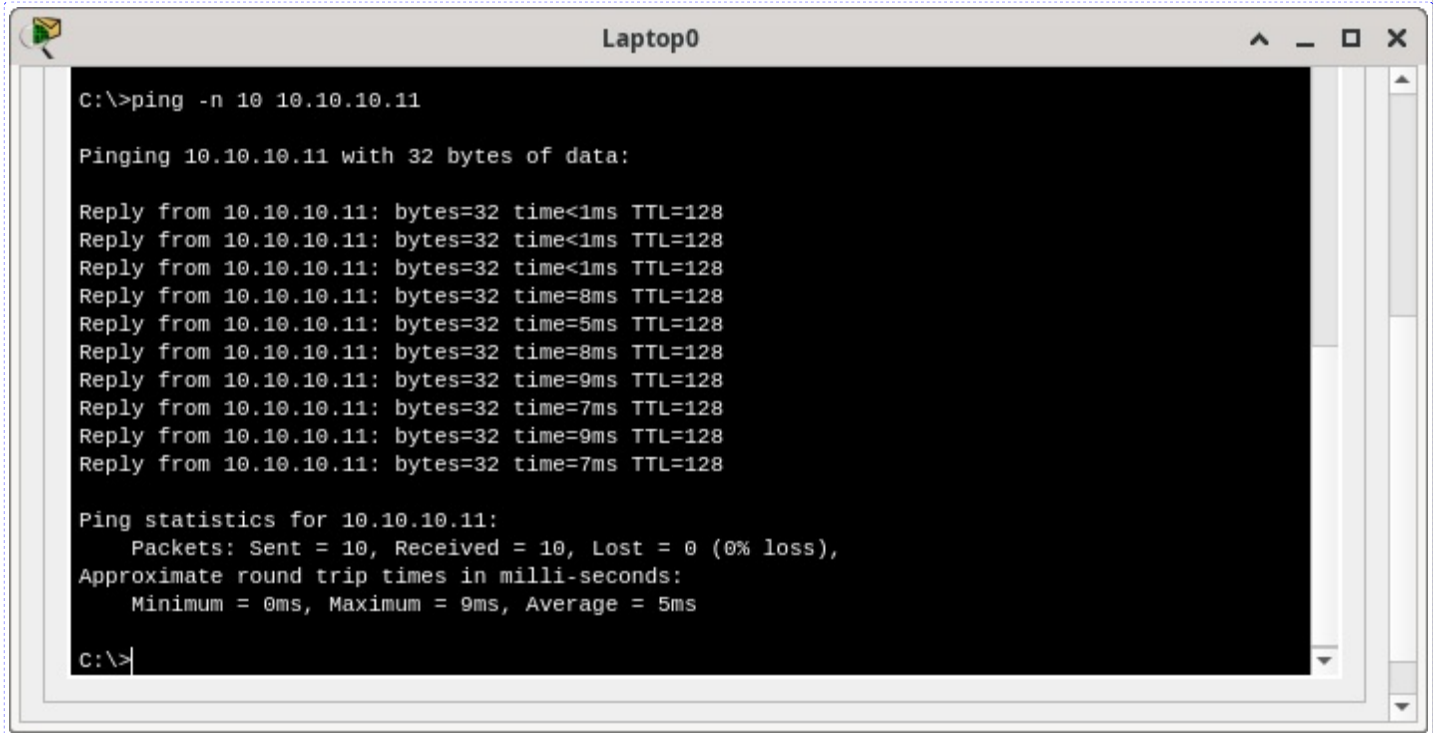
Pinging 10.10.10.10 with 32 bytes of data:

Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time=1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128
Reply from 10.10.10.10: bytes=32 time<1ms TTL=128

Ping statistics for 10.10.10.10:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- d. Do Laptop0 á IP 10.10.10.11 → ping -n 10 10.10.10.11 → Existe conectividade debido a que os 2 equipos pertencen á mesma rede e o cableado e a electrónica de rede así o permite.



```
C:\>ping -n 10 10.10.10.11

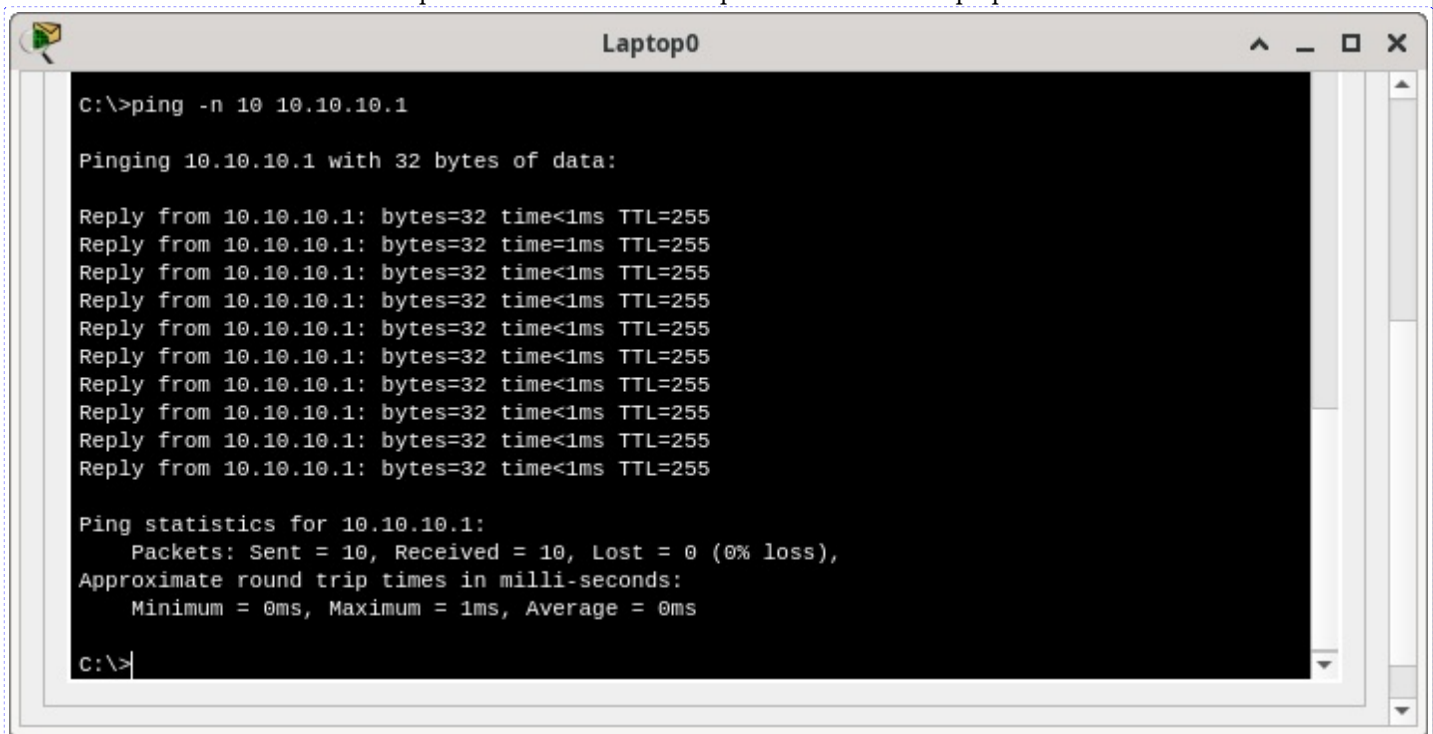
Pinging 10.10.10.11 with 32 bytes of data:

Reply from 10.10.10.11: bytes=32 time<1ms TTL=128
Reply from 10.10.10.11: bytes=32 time<1ms TTL=128
Reply from 10.10.10.11: bytes=32 time<1ms TTL=128
Reply from 10.10.10.11: bytes=32 time=8ms TTL=128
Reply from 10.10.10.11: bytes=32 time=5ms TTL=128
Reply from 10.10.10.11: bytes=32 time=8ms TTL=128
Reply from 10.10.10.11: bytes=32 time=9ms TTL=128
Reply from 10.10.10.11: bytes=32 time=7ms TTL=128
Reply from 10.10.10.11: bytes=32 time=9ms TTL=128
Reply from 10.10.10.11: bytes=32 time=7ms TTL=128

Ping statistics for 10.10.10.11:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 9ms, Average = 5ms

C:\>
```

- e. Do Laptop0 á IP 10.10.10.1 → ping -n 10 10.10.10.1 → Existe conectividade debido a que os 2 equipos pertencen á mesma rede e o cableado e a electrónica de rede así o permite. A IP 10.10.10.1 é a porta de enlace de Laptop0.



```
C:\>ping -n 10 10.10.10.1

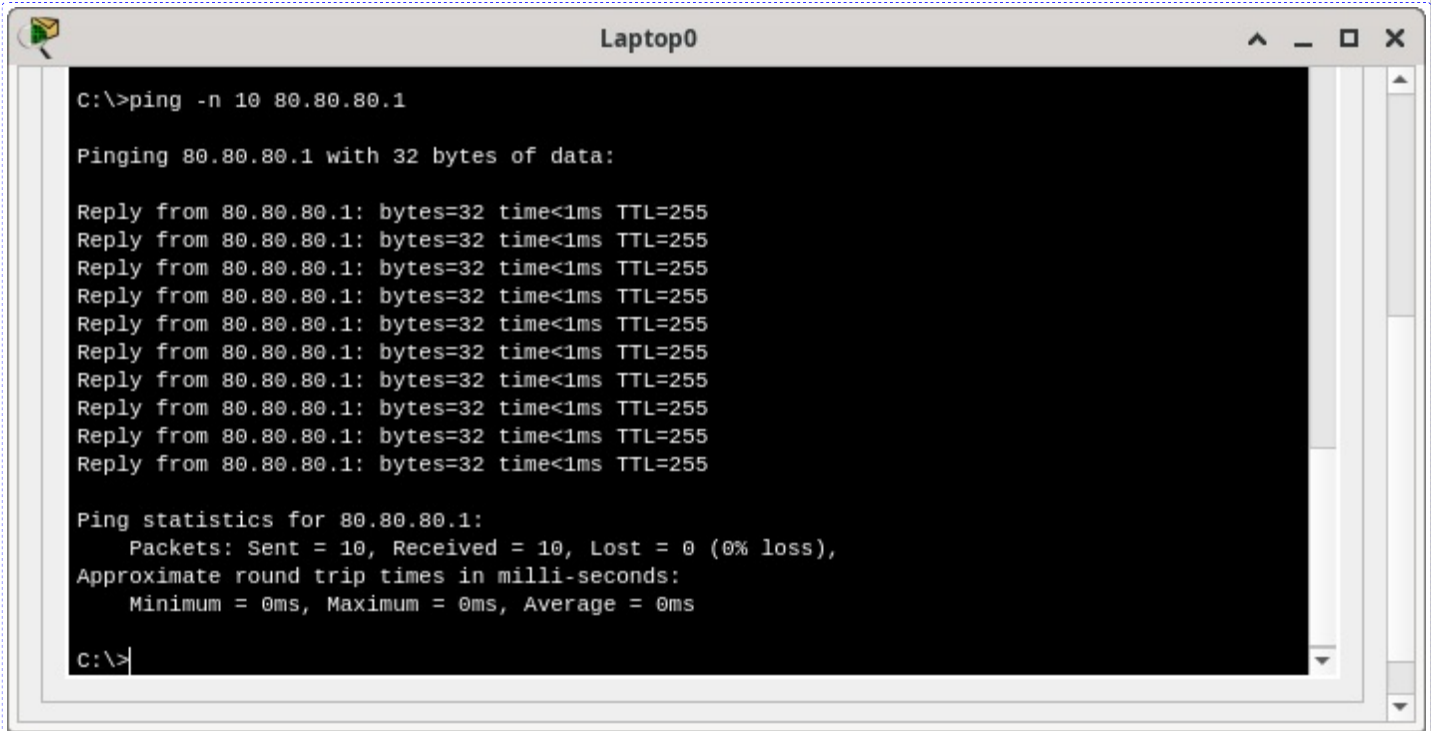
Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time=1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255
Reply from 10.10.10.1: bytes=32 time<1ms TTL=255

Ping statistics for 10.10.10.1:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- f. Do Laptop0 á IP 80.80.80.1 → ping -n 10 80.80.80.1 → Existe conectividade porque o Laptop0 ten configurado correctamente o gateway predeterminado (10.10.10.1), que corresponde á interface FastEthernet 0/0 do router. Cando o Laptop0 envía un ping a 80.80.80.1, o tráfico é dirixido ao gateway, que reenvía os paquetes a través da súa interface FastEthernet 0/1 coa IP 80.80.80.1. Este router actúa como un intermediario entre as dúas redes, permitindo a comunicación ao estar configurado correctamente coas súas interfaces en ambas redes (a 10.0.0.0/24 e a 80.0.0.0/8).



```
C:\>ping -n 10 80.80.80.1

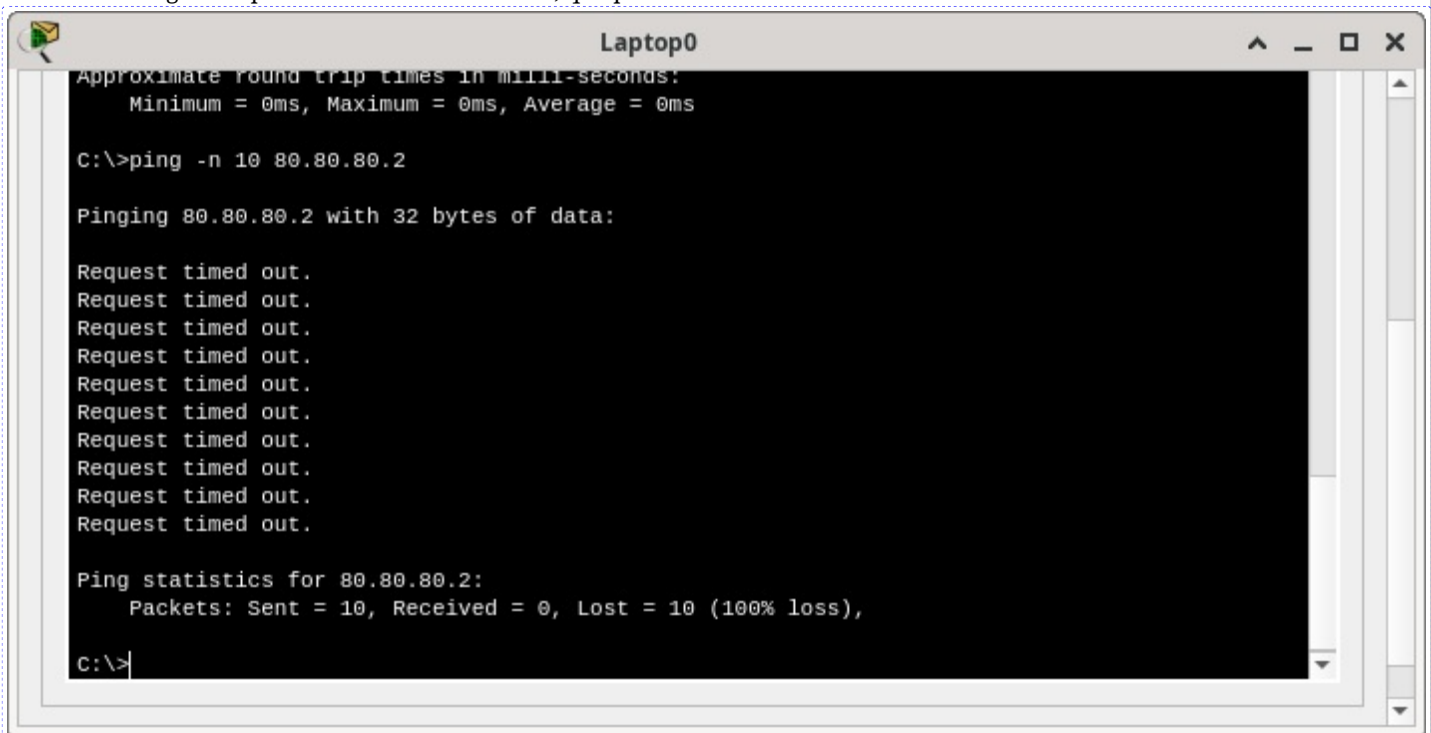
Pinging 80.80.80.1 with 32 bytes of data:

Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255
Reply from 80.80.80.1: bytes=32 time<1ms TTL=255

Ping statistics for 80.80.80.1:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

- g. Do Laptop0 á IP 80.80.80.2 → ping -n 10 80.80.80.2 → Non existe conectividade porque o Router0 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router1.



```
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping -n 10 80.80.80.2

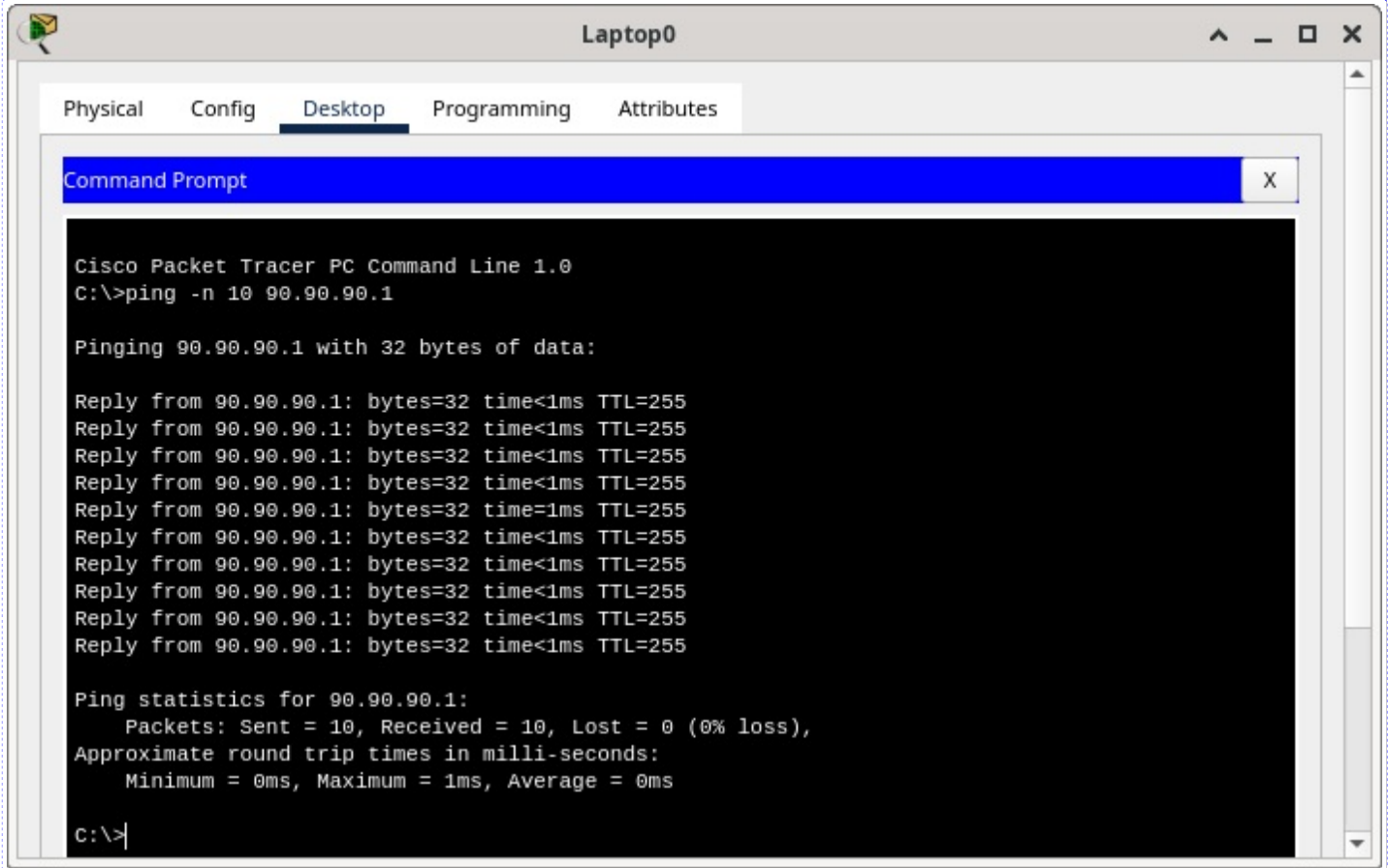
Pinging 80.80.80.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 80.80.80.2:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

- h. Do Laptop0 á IP 90.90.90.1 → ping -n 10 90.90.90.1 → Existe conectividade porque o Laptop0 ten configurado correctamente o gateway predeterminado (10.10.10.1), que corresponde á interface FastEthernet 0/0 do router. Cando o Laptop0 envía un ping a 90.90.90.1, o tráfico é dirixido ao gateway, que reenvía os paquetes a través da súa interface Ethernet 0/1/0 coa IP 90.90.90.1. Este router actúa como un intermediario entre as dúas redes, permitindo a comunicación ao estar configurado correctamente coas súas interfaces en ambas redes (a 10.0.0.0/24 e a 90.0.0.0/8).



The screenshot shows the 'Laptop0' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the command 'ping -n 10 90.90.90.1'. The output indicates that the ping was successful, with 10 packets sent and received, and a 0% loss rate. The round trip times are shown as 0ms, 1ms, and 0ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping -n 10 90.90.90.1

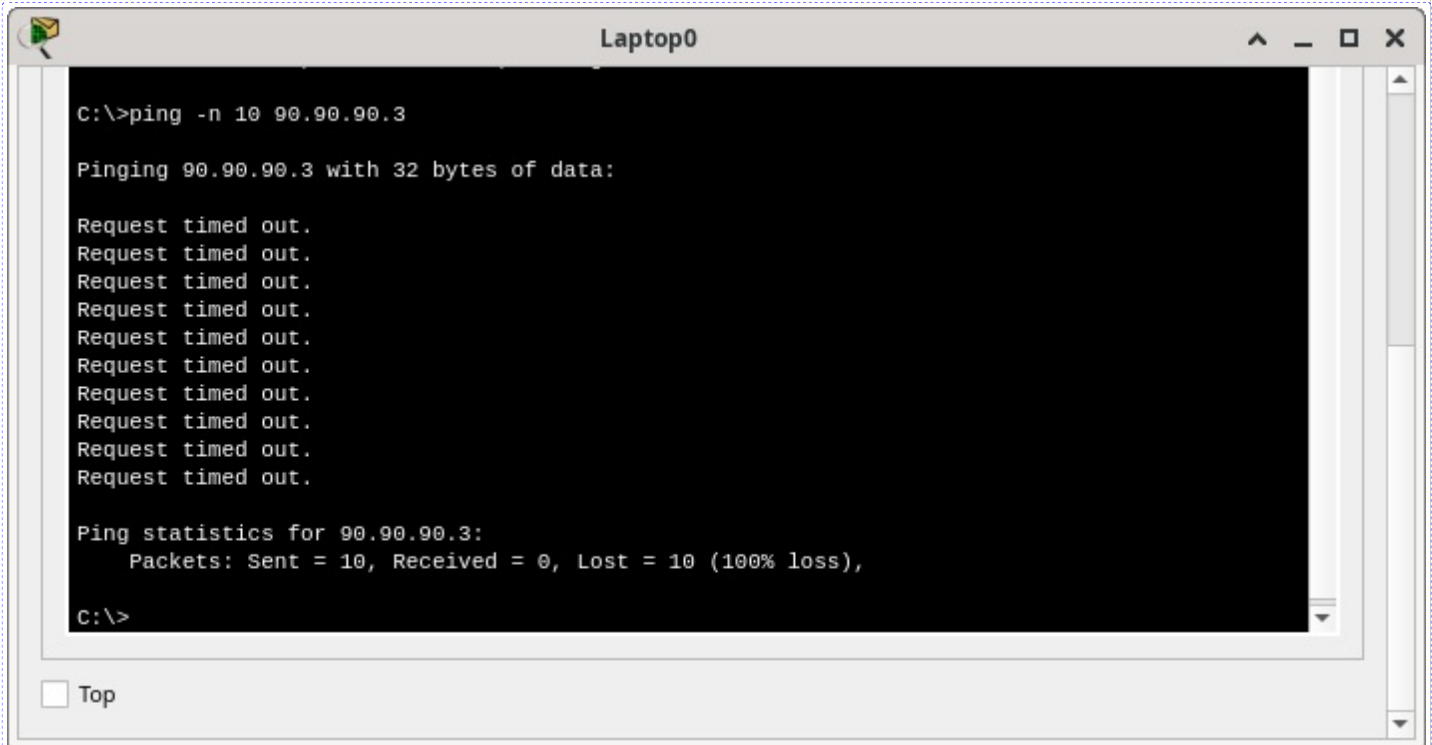
Pinging 90.90.90.1 with 32 bytes of data:

Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255
Reply from 90.90.90.1: bytes=32 time<1ms TTL=255

Ping statistics for 90.90.90.1:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

- i. Do Laptop0 á IP 90.90.90.3 → ping -n 10 90.90.90.3 → Non existe conectividade porque o Router0 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router2.



The screenshot shows the 'Laptop0' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the command 'ping -n 10 90.90.90.3'. The output indicates that the ping failed, with 10 packets sent and 0 received, resulting in a 100% loss rate. The round trip times are shown as 'Request timed out.'.

```
C:\>ping -n 10 90.90.90.3

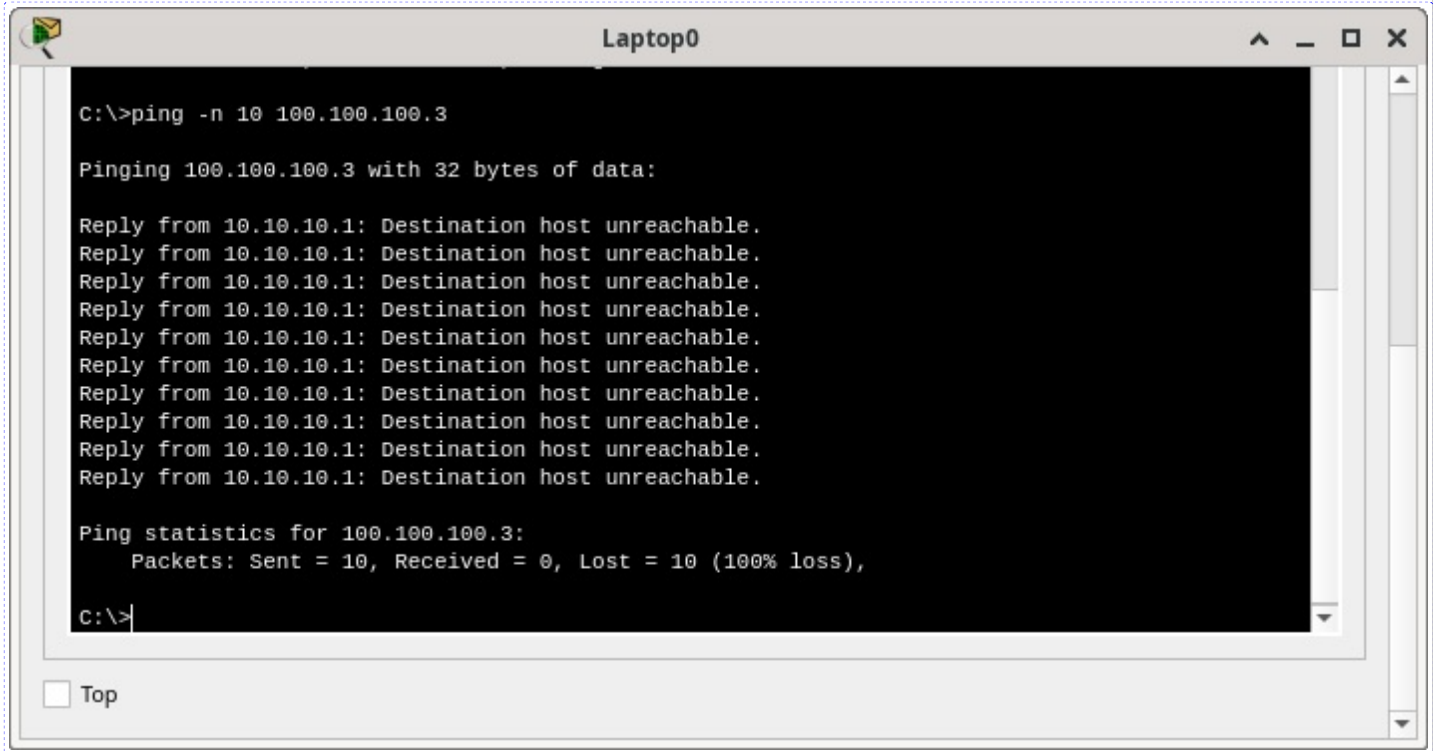
Pinging 90.90.90.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 90.90.90.3:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

- j. Do Laptop0 á IP 100.100.100.3 → ping -n 10 100.100.100.3 → Non existe conectividade porque o Router0 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router2.



```
C:\>ping -n 10 100.100.100.3

Pinging 100.100.100.3 with 32 bytes of data:

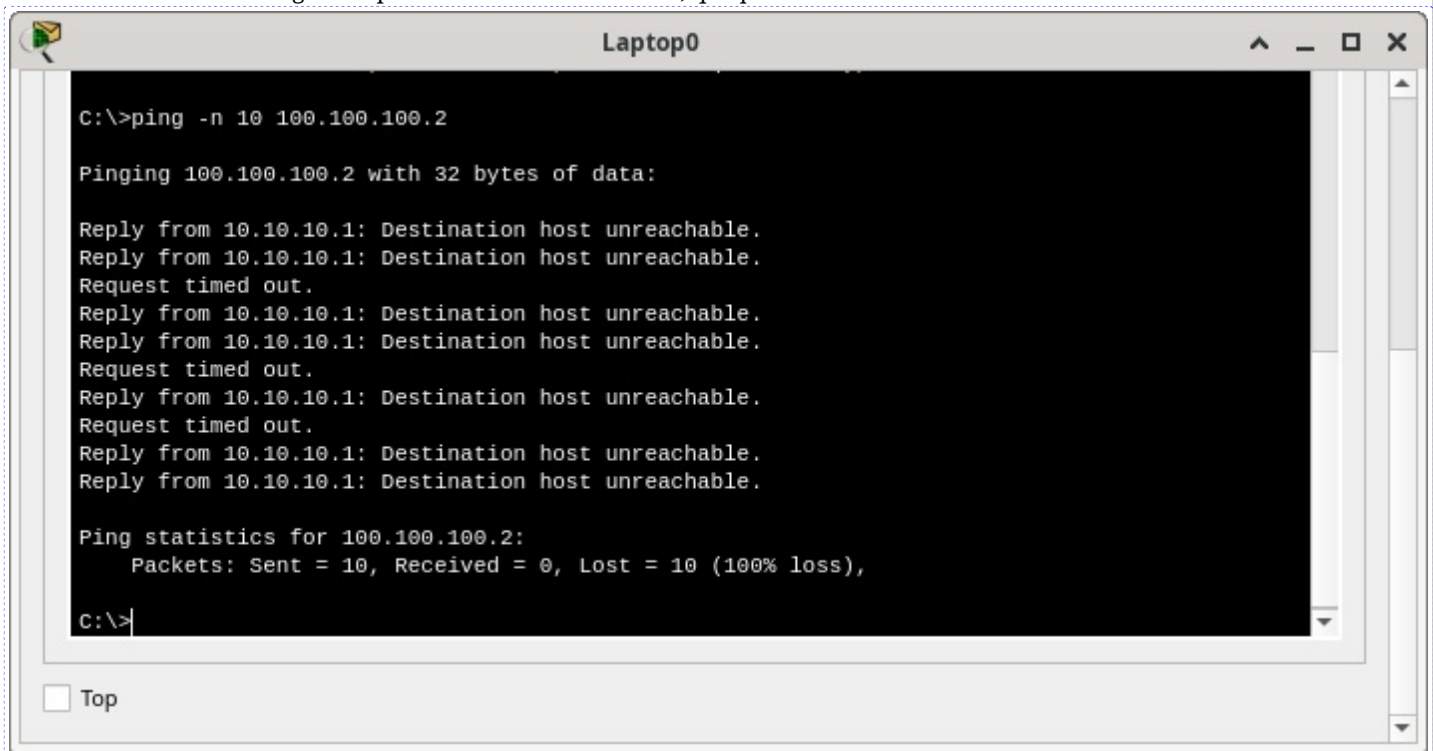
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.

Ping statistics for 100.100.100.3:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

☐ Top

- k. Do Laptop0 á IP 100.100.100.2 → ping -n 10 100.100.100.2 → Non existe conectividade porque o Router0 non ten unha ruta estática ou dinámica configurada para alcanzar esa dirección, que pertence ao Router1.



```
C:\>ping -n 10 100.100.100.2

Pinging 100.100.100.2 with 32 bytes of data:

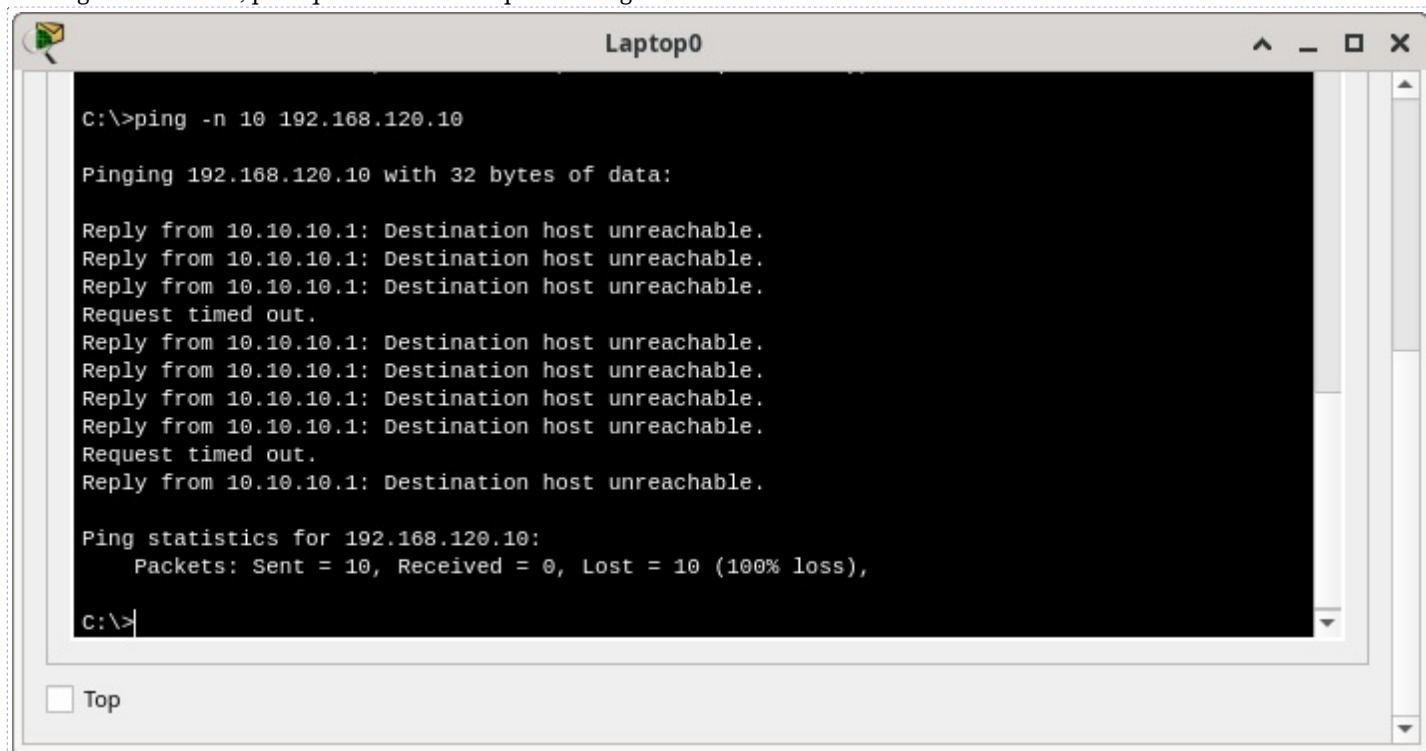
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Request timed out.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Request timed out.
Reply from 10.10.10.1: Destination host unreachable.
Request timed out.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.

Ping statistics for 100.100.100.2:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

☐ Top

1. Do Laptop0 á IP 192.168.120.10 → ping -n 10 192.168.120.10 → Non existe conectividade xa que os paquetes ICMP non son quen de chegar ao Router1, polo que xa non son capaz de chegar ao PC1.



```
C:\>ping -n 10 192.168.120.10

Pinging 192.168.120.10 with 32 bytes of data:

Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Request timed out.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Reply from 10.10.10.1: Destination host unreachable.
Request timed out.
Reply from 10.10.10.1: Destination host unreachable.

Ping statistics for 192.168.120.10:
    Packets: Sent = 10, Received = 0, Lost = 10 (100% loss),

C:\>
```

☐ Top

6. Realiza a configuración de enrutamento estático nos router (Router0, Router1 e Router2) capturando imaxes coa configuración de cada host router para que a conectividade entre PC1 e Laptop0 sexa posible.

The screenshot shows the 'Router0' configuration window with the 'Config' tab selected. The left sidebar has a tree view with categories: GLOBAL, ROUTING, SWITCHING, and INTERFACE. Under 'ROUTING', 'Static' is selected. The main area is titled 'Static Routes' and contains input fields for 'Network' (192.168.120.0), 'Mask' (255.255.255.0), and 'Next Hop' (90.90.90.3). An 'Add' button is below these fields. Below the input fields is a table with the header 'Network Address' and two rows of configured routes: '192.168.120.0/24 via 80.80.80.2' and '192.168.120.0/24 via 90.90.90.3'. A 'Remove' button is at the bottom right of the table. At the bottom of the window, there is a section titled 'Equivalent IOS Command' with a text area containing the following commands:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Ethernet0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 192.168.120.0 255.255.255.0 80.80.80.2
Router(config)#ip route 192.168.120.0 255.255.255.0 90.90.90.3
```

The screenshot shows the 'Router0' CLI window. The user has entered the command 'show ip route'. The output displays the routing table, including directly connected networks and static routes. The output is as follows:

```
Router>enable
Router#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, FastEthernet0/0
C    80.0.0.0/8 is directly connected, FastEthernet0/1
C    90.0.0.0/8 is directly connected, Ethernet0/1/0
S    192.168.120.0/24 [1/0] via 90.90.90.3
      [1/0] via 80.80.80.2

Router#
```

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

Router1

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static**
- RIP

SWITCHING

- VLAN Database

INTERFACE

- FastEthernet0/0
- FastEthernet0/1
- Ethernet0/1/0

Static Routes

Network: 10.0.0.0
Mask: 255.0.0.0
Next Hop: 100.100.100.3

Add

Network Address

- 10.0.0.0/8 via 80.80.80.1
- 10.0.0.0/8 via 100.100.100.3

Remove

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#ip route 10.0.0.0 255.0.0.0 80.80.80.1
Router(config)#ip route 10.0.0.0 255.0.0.0 100.100.100.3
Router(config)#
```

Router1

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#ip route 10.0.0.0 255.0.0.0 80.80.80.1
Router(config)#ip route 10.0.0.0 255.0.0.0 100.100.100.3
Router(config)#do 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

S    10.0.0.0/8 [1/0] via 80.80.80.1
      [1/0] via 100.100.100.3
C    80.0.0.0/8 is directly connected, FastEthernet0/0
C    100.0.0.0/8 is directly connected, Ethernet0/1/0
C    192.168.120.0/24 is directly connected, FastEthernet0/1
Router(config)#
```

Router2

Physical

Config

CLI

Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Static Routes

Network

192.168.120.0

Mask

255.255.255.0

Next Hop

100.100.100.2

Add

Network Address

10.0.0.0/8 via 90.90.90.1

192.168.120.0/24 via 100.100.100.2

Router2

Router#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

S 10.0.0.0/8 [1/0] via 90.90.90.1
C 90.0.0.0/8 is directly connected, FastEthernet0/0
C 100.0.0.0/8 is directly connected, FastEthernet0/1
S 192.168.120.0/24 [1/0] via 100.100.100.2

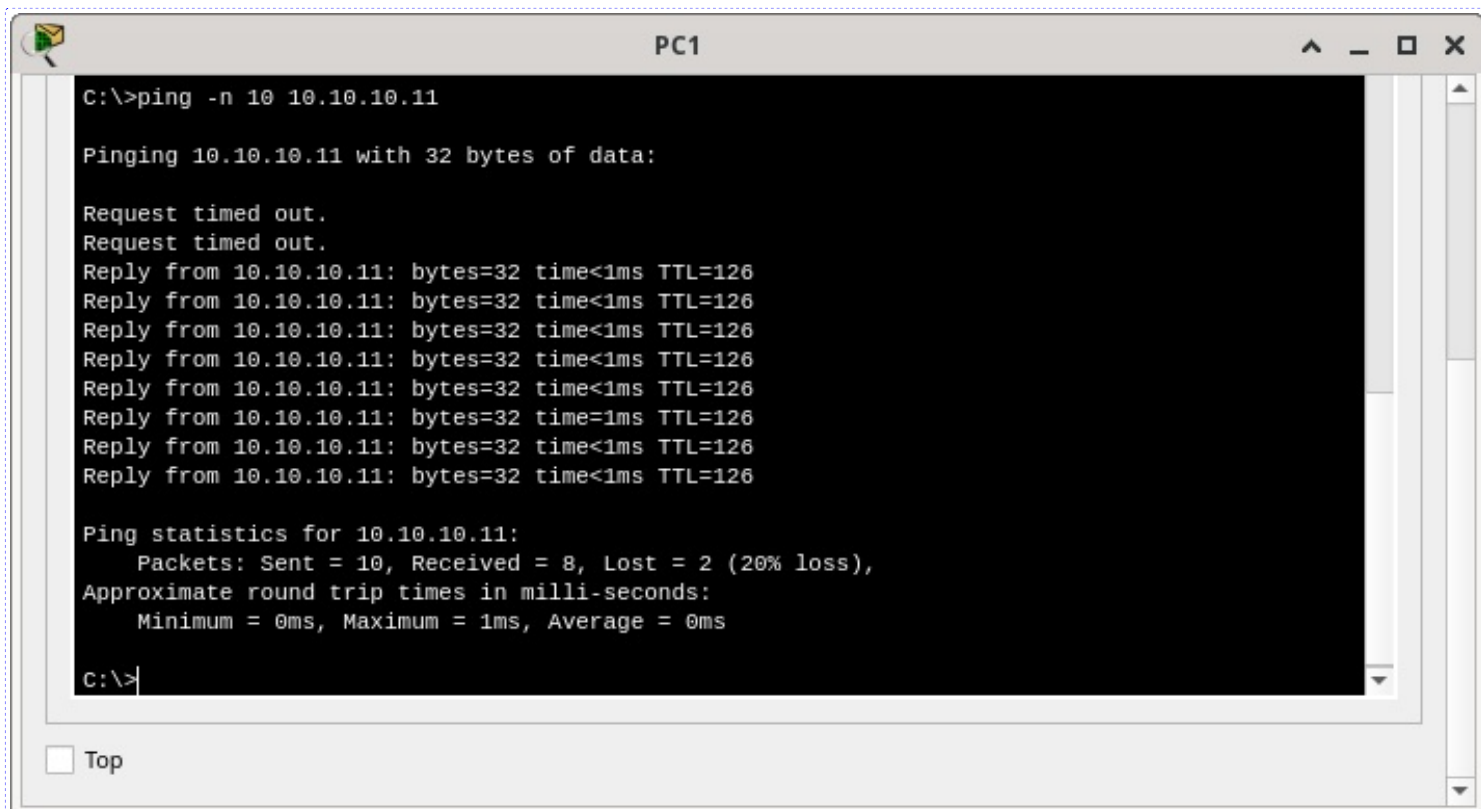
Router#

Copy

Paste

Top

7. Realiza de novo os apartados 4) e 5). Comproba que agora a conectividade é posible dende PC1 a Laptop0 e dende Laptop0 a PC1. Captura as imaxes correspondentes.



```
C:\>ping -n 10 10.10.10.11

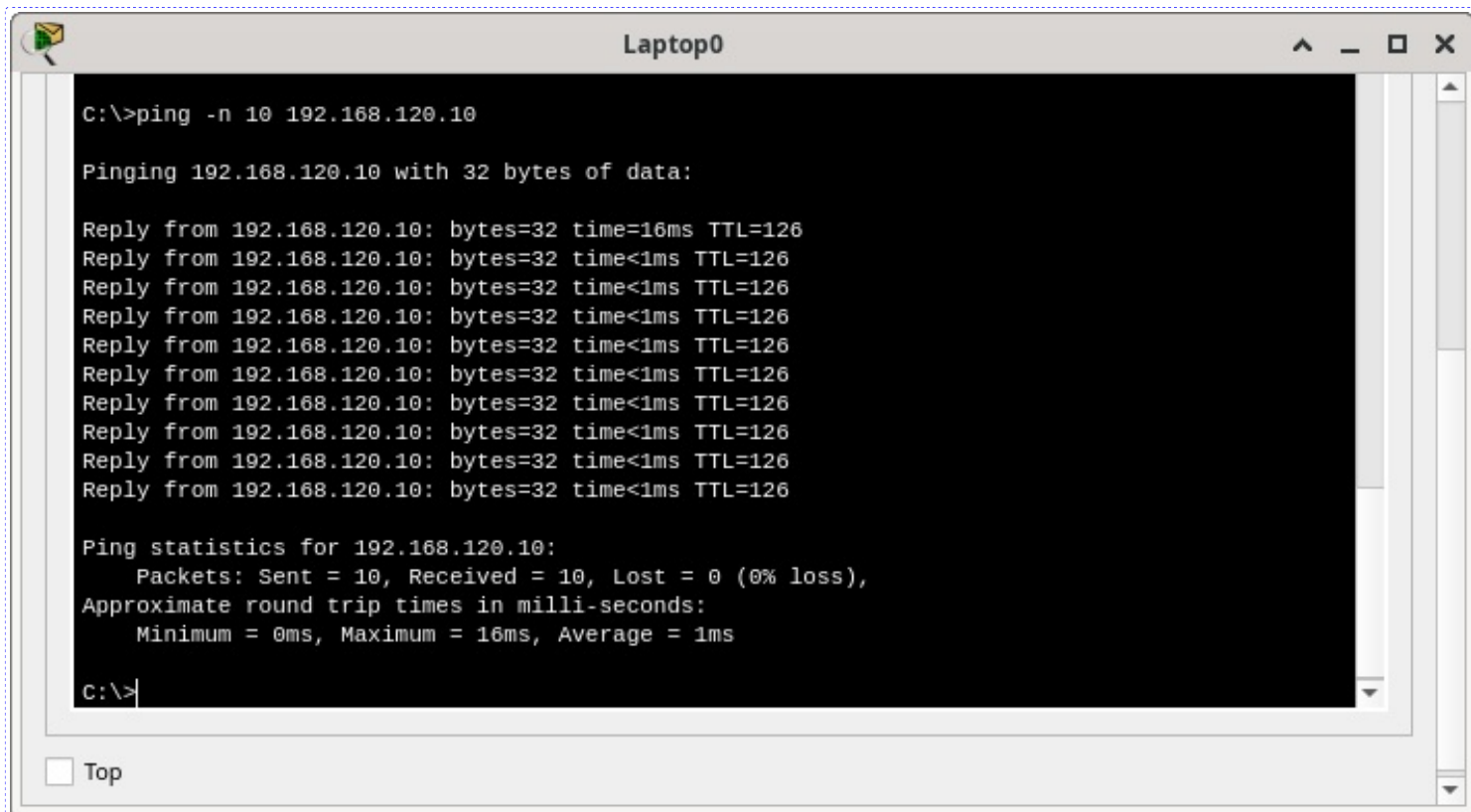
Pinging 10.10.10.11 with 32 bytes of data:

Request timed out.
Request timed out.
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126
Reply from 10.10.10.11: bytes=32 time<1ms TTL=126

Ping statistics for 10.10.10.11:
    Packets: Sent = 10, Received = 8, Lost = 2 (20% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

☐ Top



```
C:\>ping -n 10 192.168.120.10

Pinging 192.168.120.10 with 32 bytes of data:

Reply from 192.168.120.10: bytes=32 time=16ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126
Reply from 192.168.120.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.120.10:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 16ms, Average = 1ms

C:\>
```

☐ Top

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