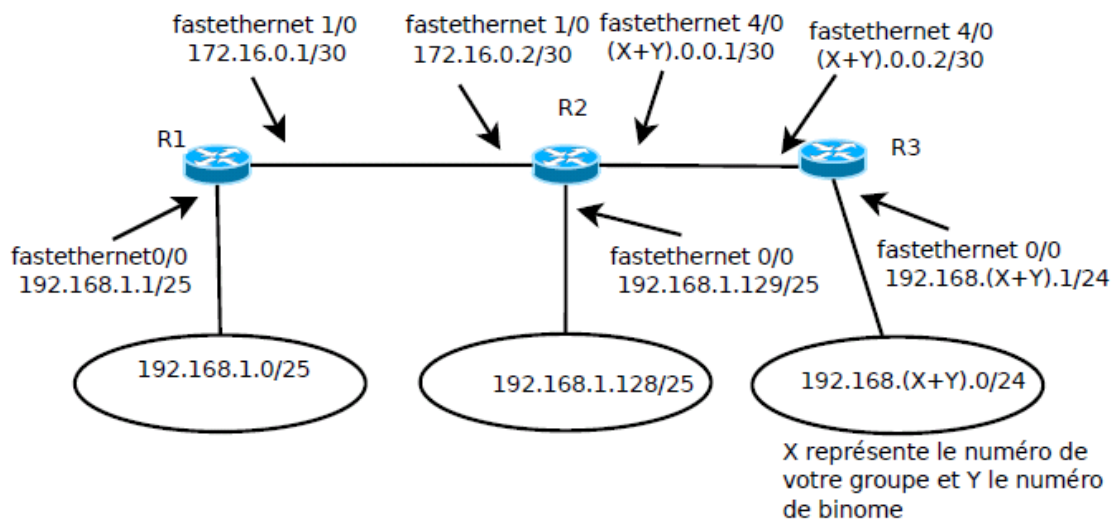


TP1 : Le routage statique sous le système IOS de Cisco

***Partie C :**

1. Modifier la topologie afin d'avoir le schéma ci-dessous.
2. Représenter deux machines au niveau du réseau $192.168.(X+Y).0/24$ et les nommer PC4 et PC5 (X dans l'adresse représente le numéro de votre groupe et Y le numéro de votre binôme).
 - a. Utiliser la deuxième adresse valide de ce réseau pour la machine PC4 .
 - b. Utiliser la troisième adresse valide de ce réseau pour la machine PC5 .



Remarque : Pour chaque test , pour chaque configuration et pour chaque vérification de configuration, donner une prise d'écran du résultat avec une brève explication.

The screenshot shows a configuration window for PC4 with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying the IP Configuration section for the FastEthernet0 interface. The IP Configuration section has two main sections: IP Configuration and IPv6 Configuration. In the IP Configuration section, the Static radio button is selected, and the fields are filled with IP Address: 192.168.43.2, Subnet Mask: 255.255.255.0, Default Gateway: 192.168.43.1, and DNS Server: 0.0.0.0. The IPv6 Configuration section has the Static radio button selected, and the fields are empty. The 802.1X section has the Use 802.1X Security checkbox unchecked, and the Authentication dropdown menu is set to MD5. The Username and Password fields are empty. A Top checkbox is located at the bottom left of the window.

PC4

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.43.2

Subnet Mask 255.255.255.0

Default Gateway 192.168.43.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::204:9AFF:FE74:20C7

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

Username

Password

☐ Top

Description: configuration IP/TCP de la machine PC4

PC5

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 192.168.43.3

Subnet Mask 255.255.255.0

Default Gateway 192.168.43.1

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

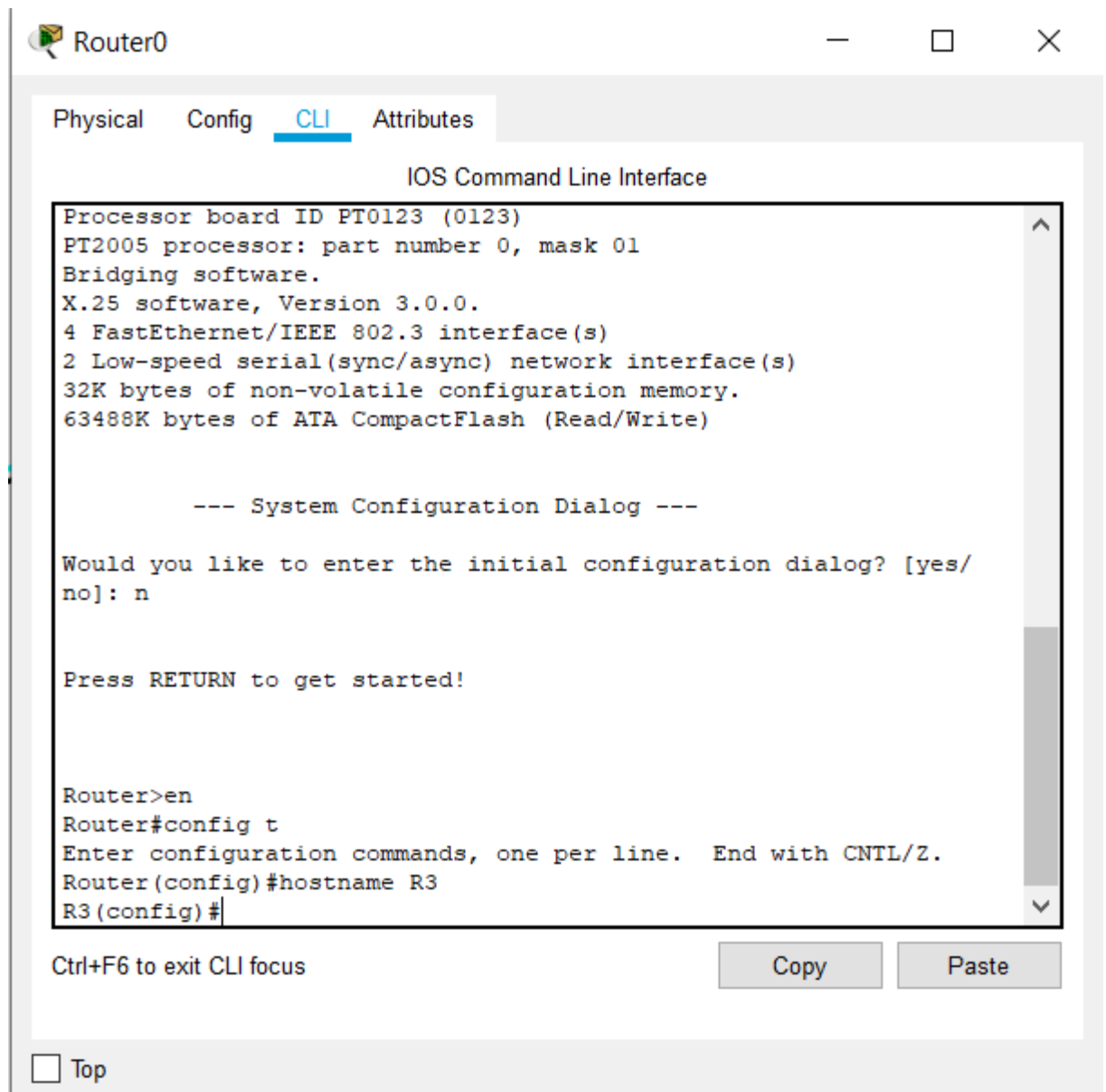
Username

Password

☐ Top

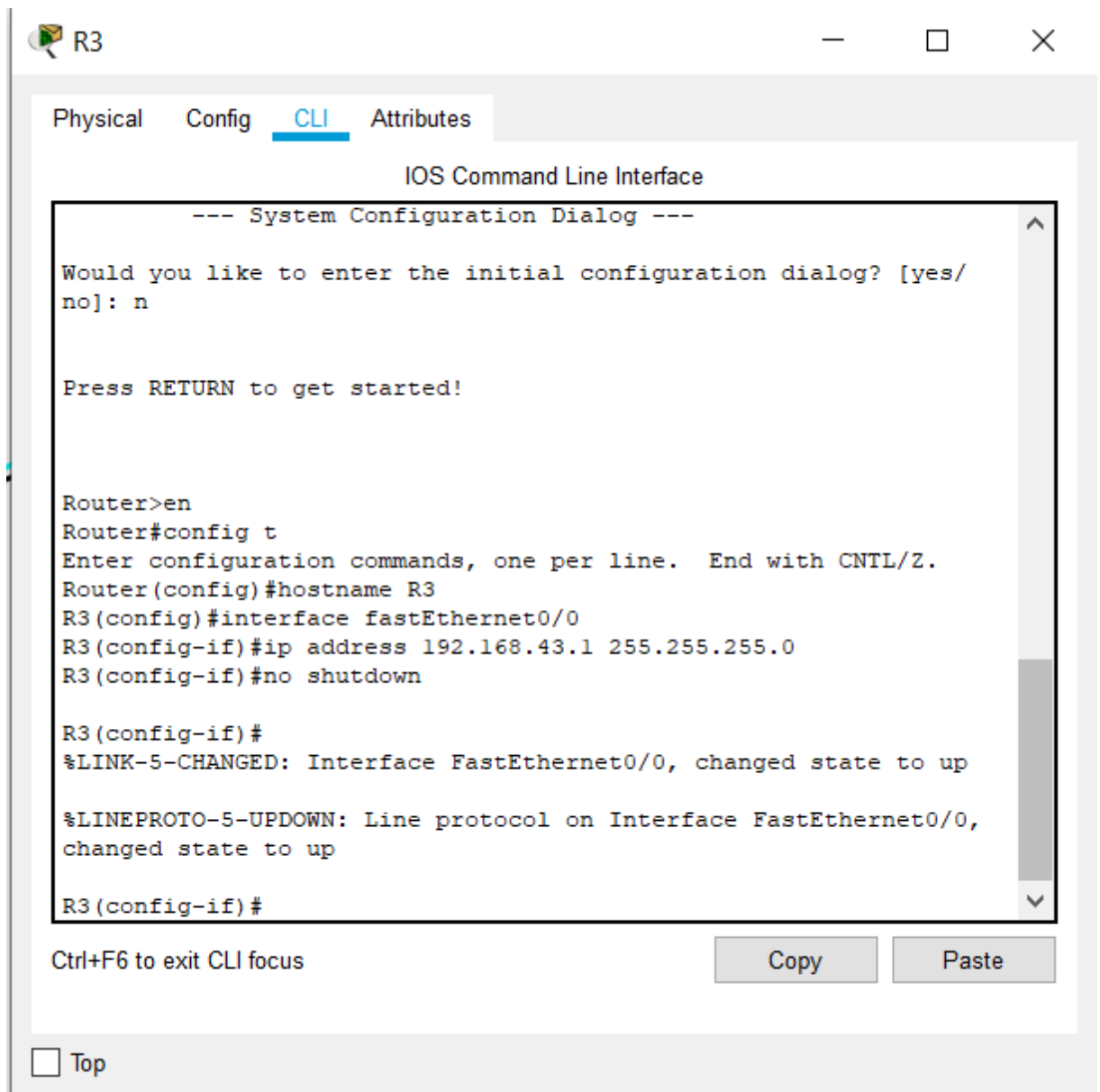
Description: configuration IP/TCP de la machine PC5

1. Nommez le nouveau routeur R3.



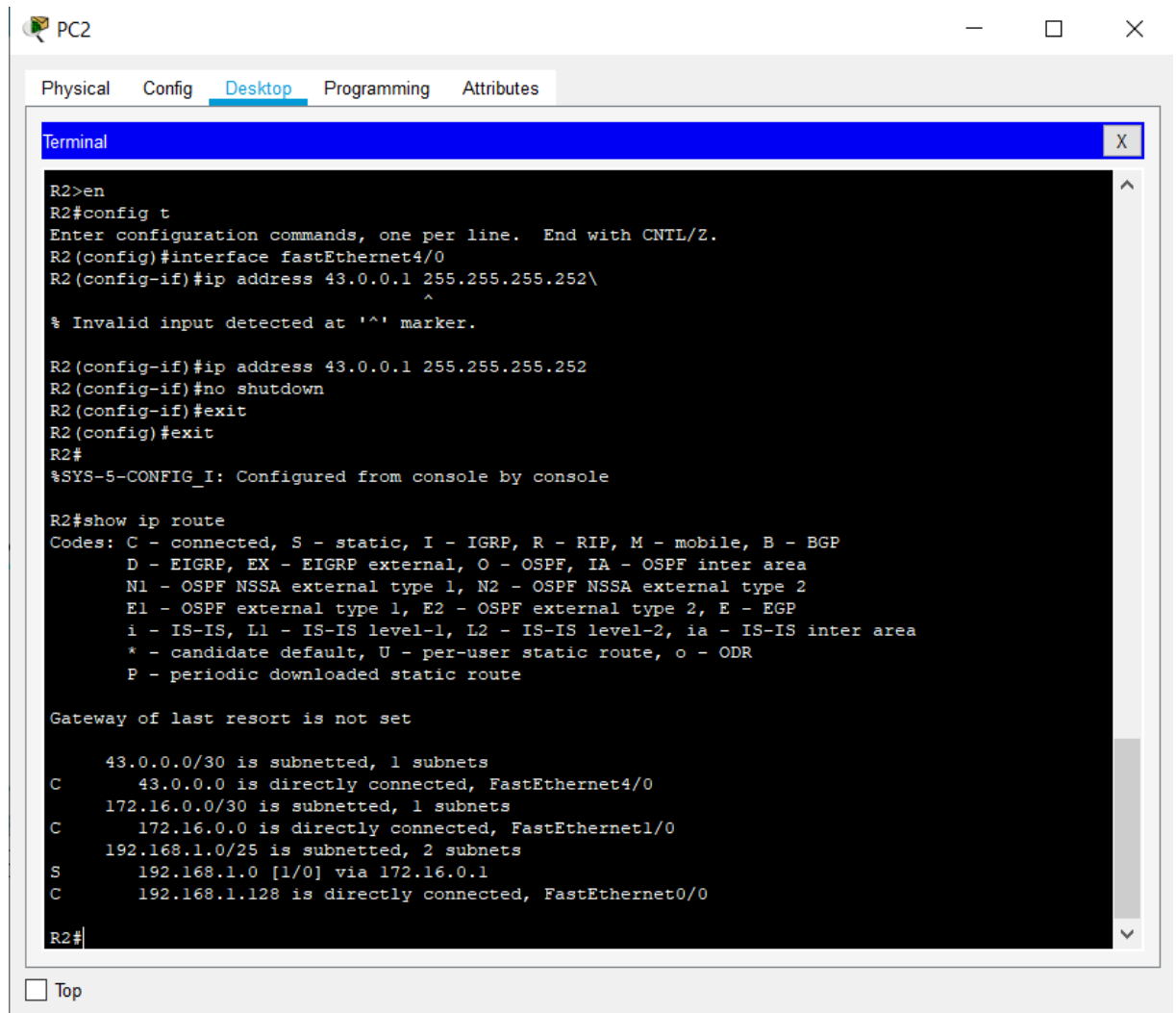
Description: Nommer le routeur R3

- Modifier les adresses des interfaces des routeurs R2 et R3 par les adresses adéquates selon le schéma précédent (donner le résultat de la commande **show interfaces** au niveau des routeurs R2 et R3).



Description: configuration de l'interface fastEthernet

- Modifier les adresses des interfaces des routeurs R2 et R3 par les adresses adéquates selon le schéma précédent (donner le résultat de la commande **show interfaces** au niveau des routeurs R2 et R3).



The screenshot shows a terminal window titled 'PC2' with tabs for Physical, Config, Desktop, Programming, and Attributes. The 'Terminal' tab is active, displaying the following commands and output:

```
R2>en
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface fastEthernet4/0
R2(config-if)#ip address 43.0.0.1 255.255.255.252\
^
% Invalid input detected at '^' marker.

R2(config-if)#ip address 43.0.0.1 255.255.255.252
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#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

    43.0.0.0/30 is subnetted, 1 subnets
C       43.0.0.0 is directly connected, FastEthernet4/0
    172.16.0.0/30 is subnetted, 1 subnets
C       172.16.0.0 is directly connected, FastEthernet1/0
    192.168.1.0/25 is subnetted, 2 subnets
S       192.168.1.0 [1/0] via 172.16.0.1
C       192.168.1.128 is directly connected, FastEthernet0/0

R2#
```

At the bottom of the terminal window, there is a checkbox labeled 'Top'.

Description: le résultat de la commande **show interfaces** au niveau de routeur R2

```

R3
Physical Config CLI Attributes
IOS Command Line Interface
$LINK-5-CHANGED: Interface FastEthernet4/0, changed state to up
$LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet4/0, changed state to up
R3(config-if)#exit
R3(config)#exit
R3#
$SYS-5-CONFIG_I: Configured from console by console
R3#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

    43.0.0.0/30 is subnetted, 1 subnets
C       43.0.0.0 is directly connected, FastEthernet4/0
C    192.168.43.0/24 is directly connected, FastEthernet0/0
R3#
Ctrl+F6 to exit CLI focus
Copy Paste
Top

```

Description: le résultat de la commande **show interfaces** au niveau de routeur R3

2. Donner les commandes à exécuter pour compléter la configuration des tables de routage des trois routeurs R1 , R2 et R3 pour assurer la communication entres les trois réseaux.

- R1:

```

R1>en
R1#config t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 192.168.43.0 255.255.255.0 172.16.0.2
R1(config)#

```

- R2:

```

R2>en
R2#config t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip route 192.168.43.0 255.255.255.0 43.0.0.2
R2(config)#

```

- R3:

```

R3>en
R3#config t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ip route 192.168.1.0 255.255.255.0 43.0.0.1

```

3. Afficher les tables de routage des trois routeurs.

• R1:

```
R1>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

    172.16.0.0/30 is subnetted, 1 subnets
C       172.16.0.0 is directly connected, FastEthernet1/0
    192.168.1.0/25 is subnetted, 2 subnets
C       192.168.1.0 is directly connected, FastEthernet0/0
S       192.168.1.128 [1/0] via 172.16.0.2
S       192.168.43.0/24 [1/0] via 172.16.0.2

R1>
```

• R2:

```
R2>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

    43.0.0.0/30 is subnetted, 1 subnets
C       43.0.0.0 is directly connected, FastEthernet4/0
    172.16.0.0/30 is subnetted, 1 subnets
C       172.16.0.0 is directly connected, FastEthernet1/0
    192.168.1.0/25 is subnetted, 2 subnets
S       192.168.1.0 [1/0] via 172.16.0.1
C       192.168.1.128 is directly connected, FastEthernet0/0
S       192.168.43.0/24 [1/0] via 43.0.0.2

R2>
```

• R3:


```

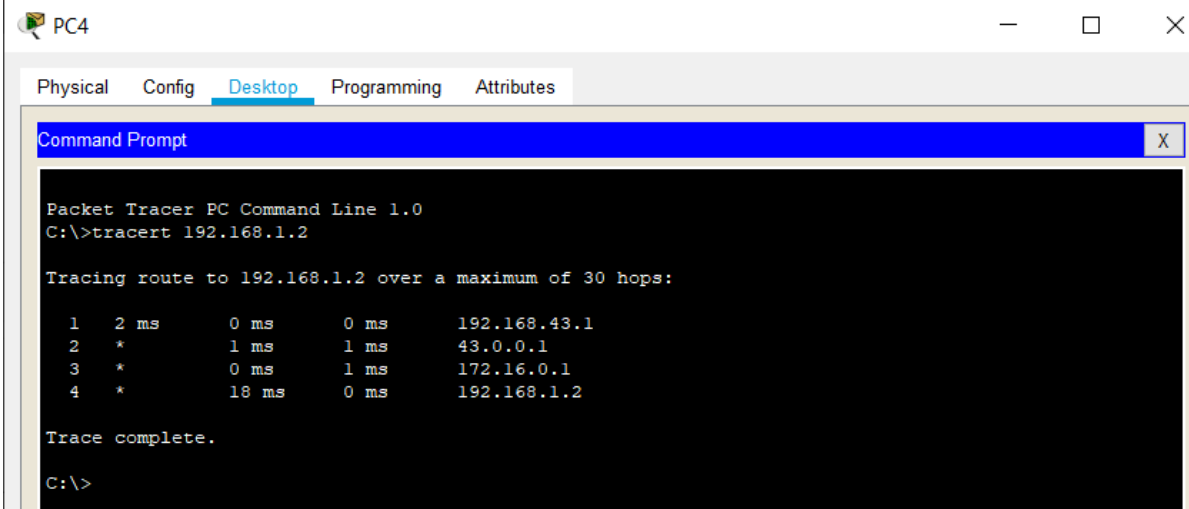
R3>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile,
B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter
area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external
type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E -
EGP
       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

    43.0.0.0/30 is subnetted, 1 subnets
C       43.0.0.0 is directly connected, FastEthernet4/0
S       192.168.1.0/24 [1/0] via 43.0.0.1
C       192.168.43.0/24 is directly connected, FastEthernet0/0

```

4. Effectuer des tests de connectivité (4 tests maximum) en utilisant la commande **ping** et la commande **tracert** pour confirmer la communication entre les trois réseaux.
 - a. Test de connectivité entre le nouveaux réseau le premier (entre PC0 et PC4):



PC4

Physical Config Desktop Programming Attributes

Command Prompt

```

Packet Tracer PC Command Line 1.0
C:\>tracert 192.168.1.2

Tracing route to 192.168.1.2 over a maximum of 30 hops:

  1  2 ms    0 ms    0 ms    192.168.43.1
  2  *        1 ms    1 ms    43.0.0.1
  3  *        0 ms    1 ms    172.16.0.1
  4  *       18 ms    0 ms    192.168.1.2

Trace complete.

C:\>

```

- b. Test de connectivité entre le réseau 1 et le nouveaux reseau (entre PC0 et PC4):

```

C:\>ping 192.168.43.2

Pinging 192.168.43.2 with 32 bytes of data:

Reply from 192.168.43.2: bytes=32 time<1ms TTL=125
Reply from 192.168.43.2: bytes=32 time=1ms TTL=125
Reply from 192.168.43.2: bytes=32 time=17ms TTL=125
Reply from 192.168.43.2: bytes=32 time=13ms TTL=125

Ping statistics for 192.168.43.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 17ms, Average = 7ms

```

- c. Test de connectivité entre le nouveaux réseau et le deuxième (entre PC2 et PC4):

```
C:\>ping 192.168.43.2

Pinging 192.168.43.2 with 32 bytes of data:

Reply from 192.168.43.2: bytes=32 time<1ms TTL=125
Reply from 192.168.43.2: bytes=32 time=1ms TTL=125
Reply from 192.168.43.2: bytes=32 time=17ms TTL=125
Reply from 192.168.43.2: bytes=32 time=13ms TTL=125

Ping statistics for 192.168.43.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 17ms, Average = 7ms
```

- d. Test de connectivité entre le deuxième et le nouveaux réseau (entre PC2 et PC4):

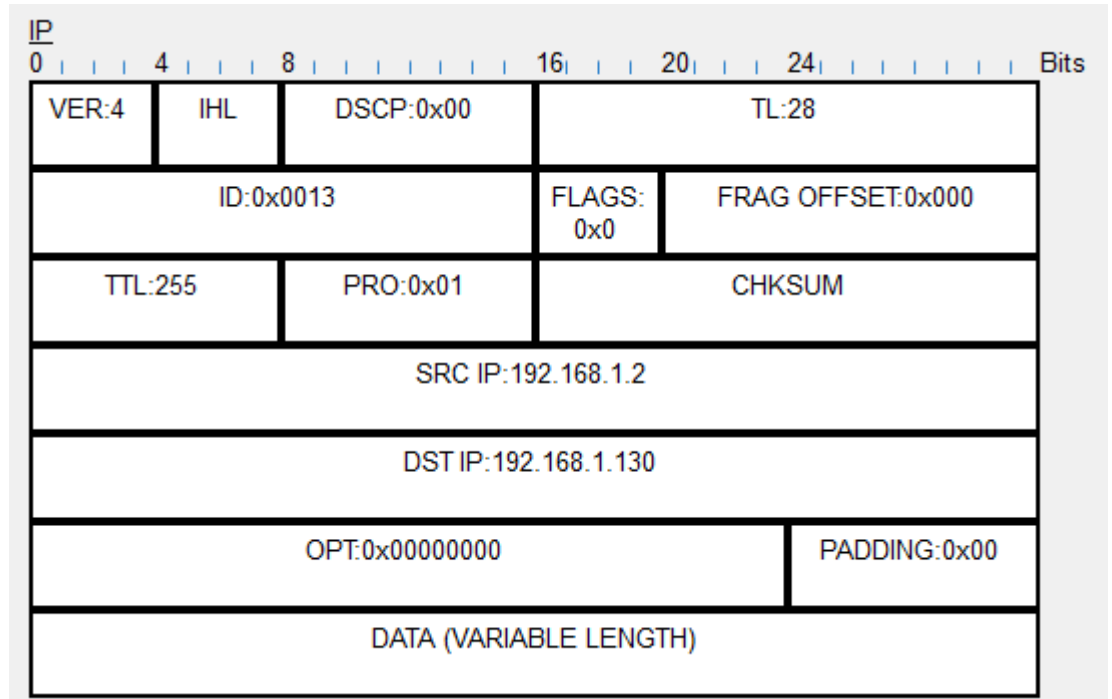
```
C:\>tracert 192.168.1.130

Tracing route to 192.168.1.130 over a maximum of 30 hops:

  0  1 ms    1 ms    0 ms    192.168.43.1
  1  0 ms    0 ms    1 ms    43.0.0.1
  2  0 ms    0 ms    1 ms    192.168.1.130

Trace complete.
```

5. En mode simulation, envoyer un paquet entre deux machines de deux réseaux différents. Montrer les champs les plus importants de l'entête du paquet au niveau de la couche 2 et 3.
- a. Les champs de la couche 3 les plus importantes sont: SRC IP et DST IP



- b. Les champs de la couche 2 les plus importantes sont: SRC ADDR et DST ADDR

PDU Formats

