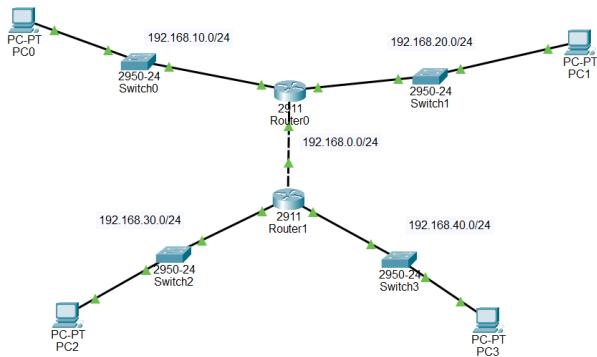


TP N° 2

1. Réaliser la topologie suivante avec routage static :



## Route Static

On a deux route static pour chaque routeur :

- Router 0 :
    - ip route 192.168.30.0 255.255.255.0 192.168.0.2
    - ip route 192.168.40.0 255.255.255.0 192.168.0.2
  - Router 1 :
    - ip route 192.168.10.0 255.255.255.0 192.168.0.1
    - ip route 192.168.20.0 255.255.255.0 192.168.0.1

- ## 2. Activer et configurer **RIP** sur le routeur 0 :

RIP

- Activer le protocole RIP on doit etre au niveau 3 et utilise : `router rip`
  - `router rip` nous fait passe au niveau 4 aussi `Router(config-router)#.`
  - Ajouter un reseau voisin au routage dynamic on doit etre au niveau 4 et utilise: `network <reseau_connue>`
  - Enlever un reseau voisin au routage dynamic on doit etre au niveau 4 et utilise: `no network <reseau_connue>`

```
Router# Physical Config CLI Attributes
Press RETURN to get started!

Router>
Router>
Router>
Router>
Router>
Router> Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 192.168.10.0
Router(config-router)#network 192.168.11.0
Router(config-router)#network 192.168.0.0
Router(config-router)#show ip routes
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       * - candidate default, U - per-user static route, o - OSPF
       I1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, B - EGP
       * - candidate default, L - load candidate default, i - OSPF inter area
       + - candidate default, U - per-user static route, o - OSPF
       P - periodic downloaded static route

Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.0.0/24 is directly connected, GigabitEthernet0/2
D        192.168.0.0/24 [1/0] via 192.168.0.2
      192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.10.0/24 is directly connected, GigabitEthernet0/0
D        192.168.10.0/24 [1/0] via 192.168.0.2
      192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.20.0/24 is directly connected, GigabitEthernet0/1
D        192.168.20.0/24 [1/0] via 192.168.0.2
      192.168.30.0/24 [1/0] via 192.168.0.2
S        192.168.40.0/24 [1/0] via 192.168.0.2

#Router(config-router)#

```

### 3. Qu'est ce qui manque à notre configuration RIP?

## Routeur 1

On n'a ni activer ni configurer le protocole **RIP** sur l'autre routeur.

### 4. Activer et configurer **RIP** sur le routeur 1 :

```

Router>
Router>
Router>#config t
Router>#router rip
Router(config)#network 192.168.30.0
Router(config-router)#network 192.168.40.0
Router(config-router)#
Router>#show ip route
Gateway of last resort is not set
192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.0.0/24 is directly connected, GigabitEthernet0/2
L 192.168.0.2/32 is directly connected, GigabitEthernet0/2
R 192.168.10.0/24 [1/0] via 192.168.0.1
S 192.168.20.0/24 [1/0] via 192.168.0.1
192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.30.0/24 is directly connected, GigabitEthernet0/0
L 192.168.30.1/32 is directly connected, GigabitEthernet0/0
D 192.168.40.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.40.0/24 is directly connected, GigabitEthernet0/1
L 192.168.40.1/32 is directly connected, GigabitEthernet0/1
Router(config-router)#

```

### 5. Pourquoi on ne voit aucune route R (**RIP**) dans la table de routage de deux routeurs malgres qu'on a activer et configurer **RIP**?

## Distance Administrative

distance Administrative : permet au routeur de choisir quelle protocole utiliser si plusieurs protocoles ont été utilisés pour configurer pour une même route plus il est petit plus le protocole est fiable	
Routing Protocol	Administrative Distance
Directly connected	0
Static route	1
Internal EIGRP	90
OSPF	110
RIP	120
External EIGRP	170
Unknown	255

**Cout Du chemin (metric)**: utilise par des protocoles adaptatifs pour déterminer le chemin optimal.  
exemple : RIP utilise le hop cost qui représente le nombre de routeur auquelle on doit passer pour atteindre destination.  
si le protocole est déterministique (exemple static) le routeur ne la prendra pas en considération et la mettra 0 (car il y a un seul chemin défini manuellement).

le routeur a préféré utiliser le routage static car il a une distance administrative plus petite (static)  $1 < 120$  (**RIP**)

## 6. Enlever tout les routages static :

### Enlever Routage Static

```
no ip route <ip_reseau_ignored> <mask_reseau_ignored> <ip_voisin_pour_accéder>
```

```
Router(config)# no ip route 192.168.30.0 255.255.255.0 192.168.0.2
Router(config)# show ip route
Codes: L - local, C - connected, S - static, 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 level-1, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
# - periodic downloaded static route

Gateway of last resort is not set

192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.0.0/24 is directly connected, GigabitEthernet0/2
L     192.168.0.2/32 is directly connected, GigabitEthernet0/2
C     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/0
L       192.168.10.1/32 is directly connected, GigabitEthernet0/1
R       192.168.30.0/24 [120/0] via 192.168.0.2
R       192.168.40.0/24 [120/0] via 192.168.0.2

Router(config)#

```

```
Router(config-crouter)# no ip route 192.168.20.0 255.255.255.0 192.168.0.1
Router(config)# show ip route
Codes: L - local, C - connected, S - static, 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 level-1, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
# - periodic downloaded static route

Gateway of last resort is not set

192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C     192.168.0.0/24 is directly connected, GigabitEthernet0/2
L     192.168.0.2/32 is directly connected, GigabitEthernet0/2
C     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/0
L       192.168.10.1/32 is directly connected, GigabitEthernet0/1
R       192.168.30.0/24 [120/1] via 192.168.0.2, 00:00:14, GigabitEthernet0/2
R       192.168.40.0/24 [120/1] via 192.168.0.2, 00:00:14, GigabitEthernet0/2

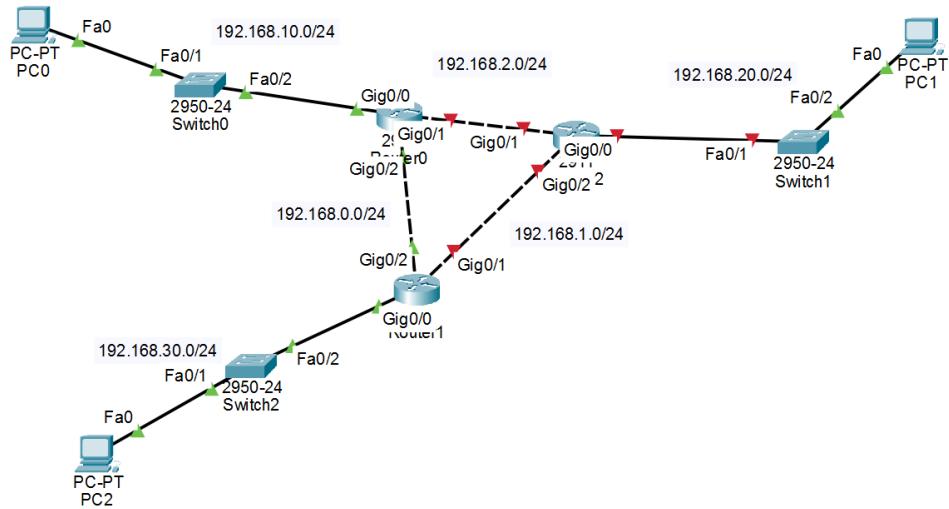
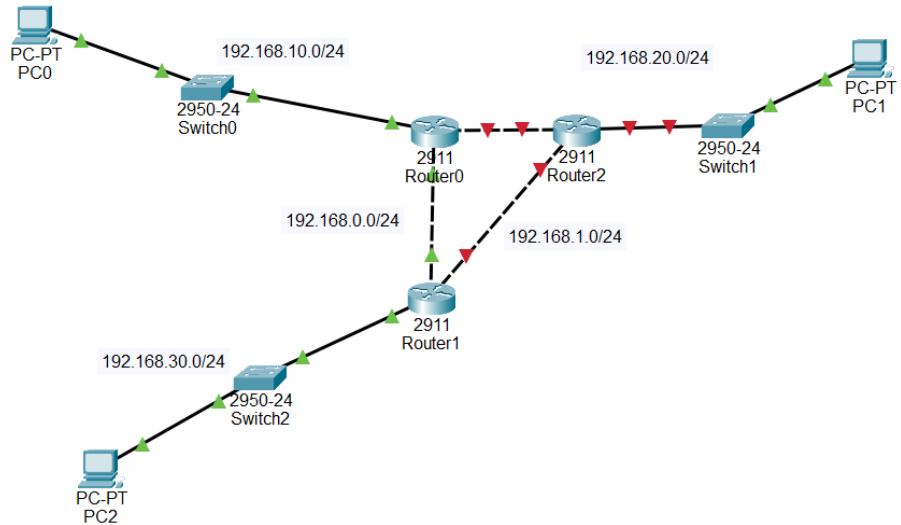
Router(config)#

```

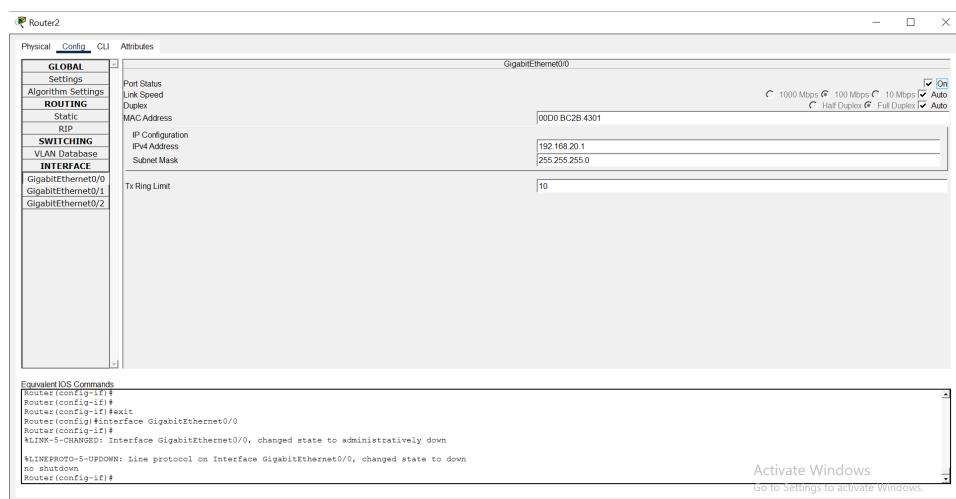
### Remarque

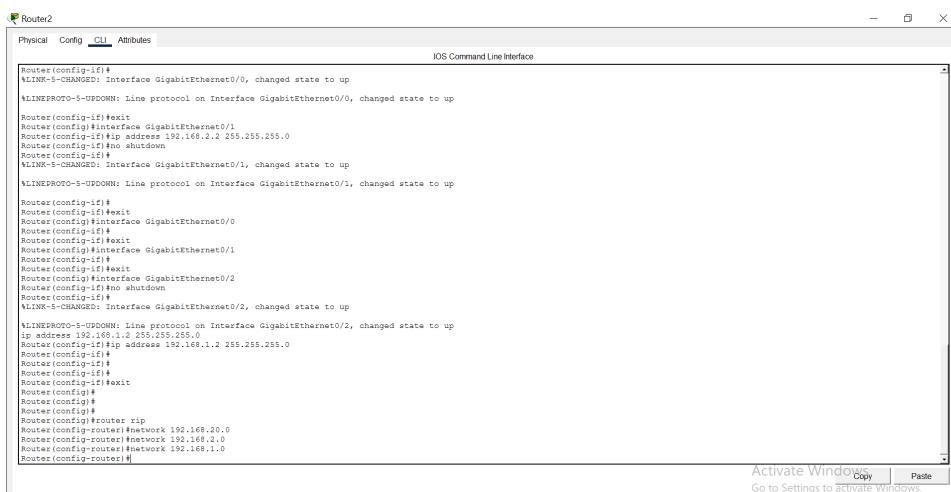
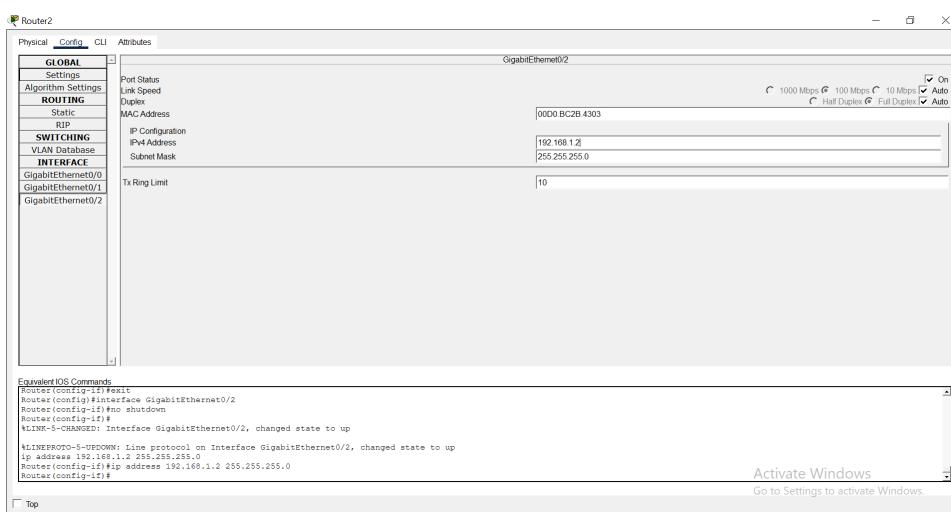
On remarque que la table de routage c'est met à jour automatiquement après avoir enlever le routage static on a un routage **RIP dynamic** avec une distance administrative de 120 et le hop cost de 1 (passe par un routeur pour atteindre la destination).

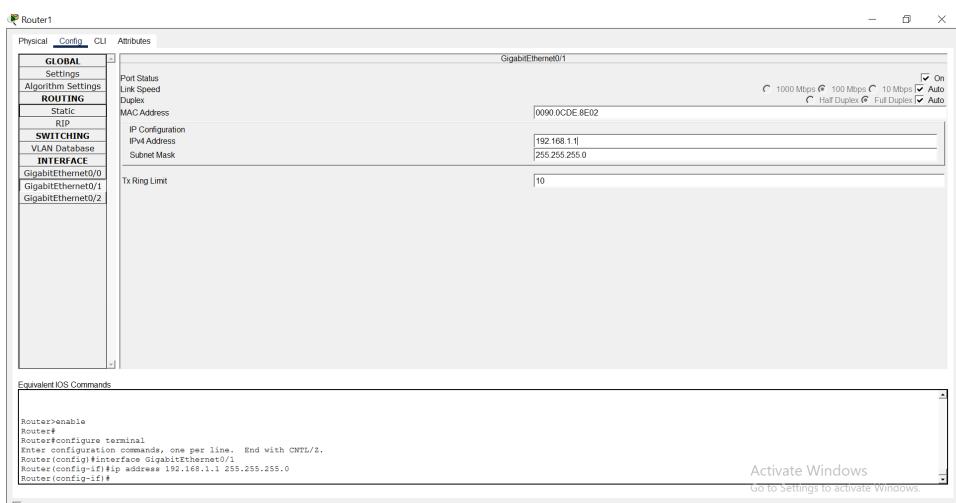
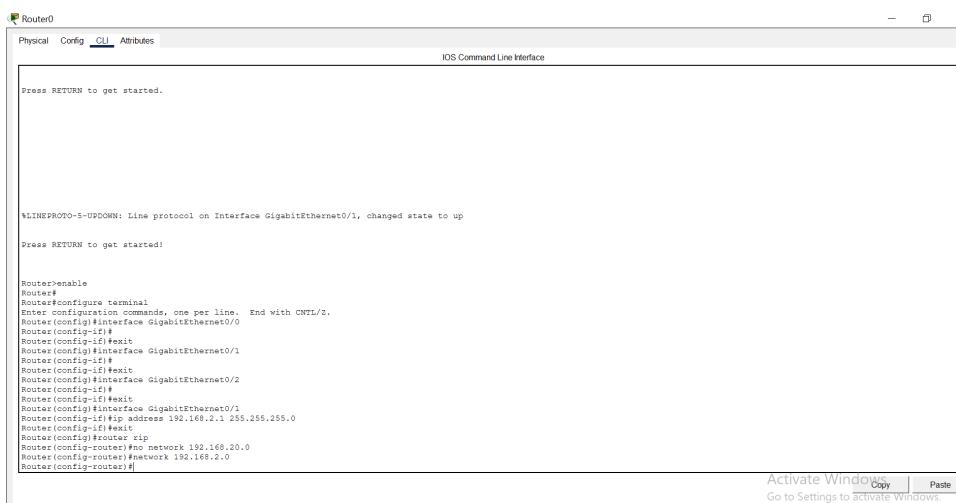
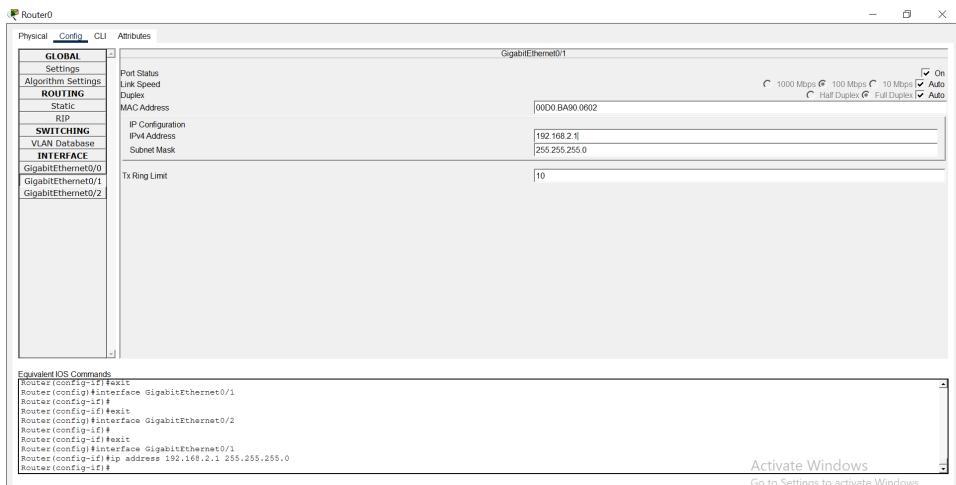
7. Changer la topologie pour qu'elle devient comme suit :



#### 8. Configurer tout les routeurs comme il se doit :







The screenshot shows a software application window titled "Router1". The top menu bar includes "Physical", "Config", "CLI", and "Attributes", with "CLI" being the active tab. A sub-header "IOS Command Line Interface" is displayed above the main content area. The main pane contains several lines of text:

```
Router con0 is now available

Press RETURN to get started.

Press RETURN to get started!

Router>enable
Router#
Router>configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet0/1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#ip
Router(config-router)#no network 192.168.40.0
Router(config-router)#network 192.168.1.0
Router(config-router)#

```

9. Afficher les tables de routage apres mise-a-jour :

```
Router# Physical Config CLI Attributes
Router# show ip route
Router(config)# exit
Router(config)interface GigabitEthernet0/1
Router(config-if)# exit
Router(config)interface GigabitEthernet0/2
Router(config-if)# exit
Router(config)interface GigabitEthernet0/1
Router(config-if)# exit
Router(config-if)# rip
Router(config-if)# network 192.168.20.0
Router(config-router)#
Router(config-router)show ip routes
Router(config-router)# show ip routes
Gateway of last resort is not set

 192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.0.0/24 is directly connected, GigabitEthernet0/2
D 192.168.0.0/24 via 192.168.2.2, 0:00:00:07, GigabitEthernet0/1
R 192.168.0.0/24 [120/1] via 192.168.2.2, 0:00:00:07, GigabitEthernet0/1
[120/1] via 192.168.2.2, 0:00:00:00, GigabitEthernet0/2
  192.168.2.0/24
C 192.168.2.0/24 is directly connected, GigabitEthernet0/1
L 192.168.2.1/32 is directly connected, GigabitEthernet0/1
  192.168.2.1/32
C 192.168.10.0/24 is directly connected, GigabitEthernet0/0
L 192.168.10.1/32 is directly connected, GigabitEthernet0/0
  192.168.10.1/32
R 192.168.30.0/24 [120/1] via 192.168.0.2, 0:00:00:00, GigabitEthernet0/1
R 192.168.30.0/24 [120/1] via 192.168.0.2, 0:00:00:00, GigabitEthernet0/2
R 192.168.40.0/24 is possibly down, routing via 192.168.0.2, GigabitEthernet0/2

Router(config-router)#
Router(config-router)#

```

```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

Press RETURN to get started!

Router#enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 192.168.1.0
Router(config-router)#show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
          * - candidate default, D - user static route, o - ODR
          P - periodic downloaded static route
Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.0.0/24 is directly connected, GigabitEthernet0/0
L        192.168.0.2/24 is directly connected, GigabitEthernet0/2
      192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.1.0/24 is directly connected, GigabitEthernet0/1
L        192.168.1.1/32 is directly connected, GigabitEthernet0/0
R      192.168.2.0/24 [120/1] via 192.168.1.1, 00:00:08, GigabitEthernet0/2
          metric 120, weight 0, state 0, valid until never
          metric 120, weight 0, state 0, valid until never
R      192.168.10.0/24 [120/1] via 192.168.0.1, 00:00:08, GigabitEthernet0/2
R      192.168.20.0/24 [120/1] via 192.168.1.2, 00:00:08, GigabitEthernet0/1
          metric 120, weight 0, state 0, valid until never
          metric 120, weight 0, state 0, valid until never
C        192.168.30.0/24 is directly connected, GigabitEthernet0/0
L        192.168.30.1/32 is directly connected, GigabitEthernet0/0
R      192.168.40.0/24 is possibly down, routing via 192.168.1.2, GigabitEthernet0/1

Router(config-router)#

```

Router# Router2

Physical Config CLI Attributes

IOS Command Line Interface

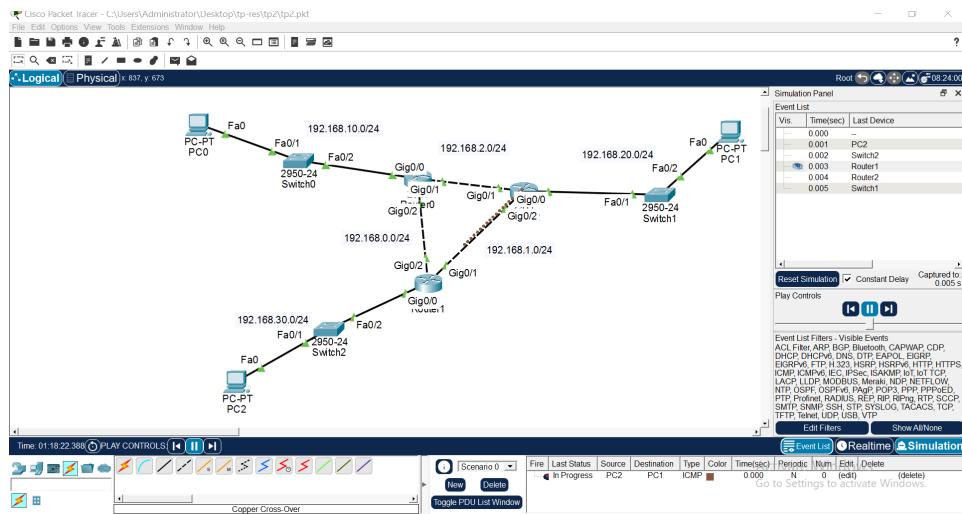
```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)# show ip route
Codes: * - static, S - static, R - RIP, M - mobile, B - BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2
      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

R  192.168.0.0/24 [120/1] via 192.168.2.1, 00:00:00, GigabitEthernet0/1
      [120/1] via 192.168.1.1, 00:00:04, GigabitEthernet0/2
      192.168.1.0/24 is directly connected, GigabitEthernet0/2
      192.168.1.0/24 is directly connected, 192.168.1.1, 00:00:04, GigabitEthernet0/2
      1 mask
C  192.168.1.0/24 is directly connected, GigabitEthernet0/2
L  192.168.1.2/32 is directly connected, GigabitEthernet0/2
      1 mask
C  192.168.2.0/24 is directly connected, GigabitEthernet0/1
L  192.168.2.2/32 is directly connected, GigabitEthernet0/1
      1 mask
      192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
      192.168.20.0/24 is directly connected, GigabitEthernet0/0
      192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
      192.168.20.0/24 is directly connected, GigabitEthernet0/0
      192.168.20.0/24 is possibly down, routing via 192.168.1.1, 00:00:00, GigabitEthernet0/1
      192.168.40.0/24 is possibly down, routing via 192.168.2.1, GigabitEthernet0/1

Router(config)#[
```

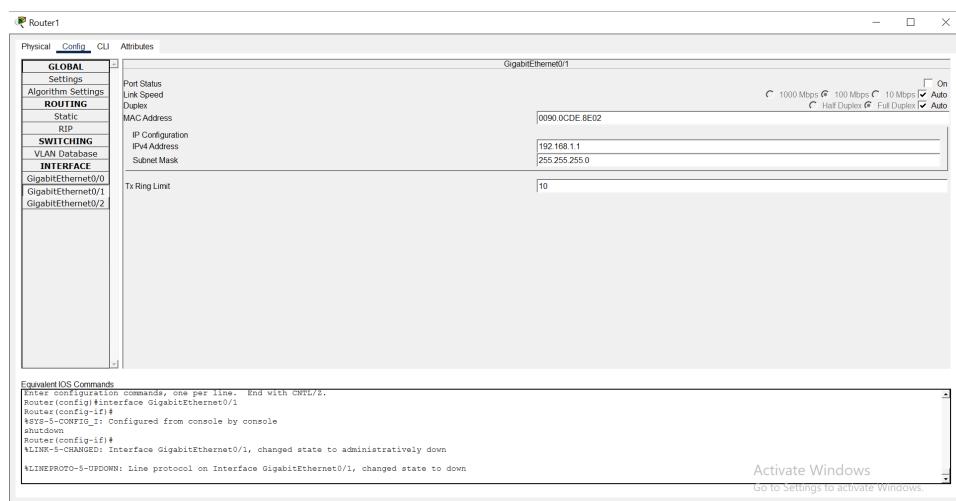
10. faites un ping simulation du PC2 au PC1:



## Remarque

On remarque que le routeur 1 prend le chemin avec le plus hop cost il est alle au routeur 2 directement sans avoir a passer au routeur 0 puis routeur 2.

11. Desactiver l'interface G 0/1 du routeur 1 :



12. Afficher la table de routage du routeur 1 apres avoir desactiver l'interface :

```

Router# show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
      * - candidate default, # - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
      | 192.168.0.0/24 is directly connected, GigabitEthernet0/0
      | 192.168.30.1/32 is directly connected, GigabitEthernet0/1
      |
      192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
      | 192.168.20.0/24 is directly connected, GigabitEthernet0/2
      | 192.168.10.0/24 [120/1] via 192.168.0.1, 00:00:02, GigabitEthernet0/0
      | 192.168.20.0/24 [120/2] via 192.168.0.1, 00:00:02, GigabitEthernet0/2
      |
      192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
      | 192.168.30.0/24 is directly connected, GigabitEthernet0/0
      | 192.168.30.1/32 is directly connected, GigabitEthernet0/1

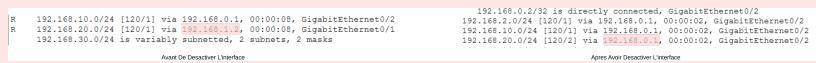
Router# show ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
      * - candidate default, # - per-user static route, o - ODR
      P - periodic downloaded static route

Gateway of last resort is not set

      192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks
      | 192.168.0.0/24 is directly connected, GigabitEthernet0/0
      | 192.168.0.2/32 is directly connected, GigabitEthernet0/2
      |
      192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
      | 192.168.20.0/24 is directly connected, GigabitEthernet0/2
      | 192.168.10.0/24 [120/1] via 192.168.0.1, 00:00:02, GigabitEthernet0/0
      |
      192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
      | 192.168.30.0/24 is directly connected, GigabitEthernet0/0
      | 192.168.30.1/32 is directly connected, GigabitEthernet0/1
  
```

## Remarque

Pour acceder au reseau 192.168.20.0/24 il passe par le routeur 0 parceque l'interface relie avec le routeur 2 a ete desactiver :



13. refaire un ping simulation du PC2 au PC1:

