DERSIM BESIKTAS
TP 6 - Routage

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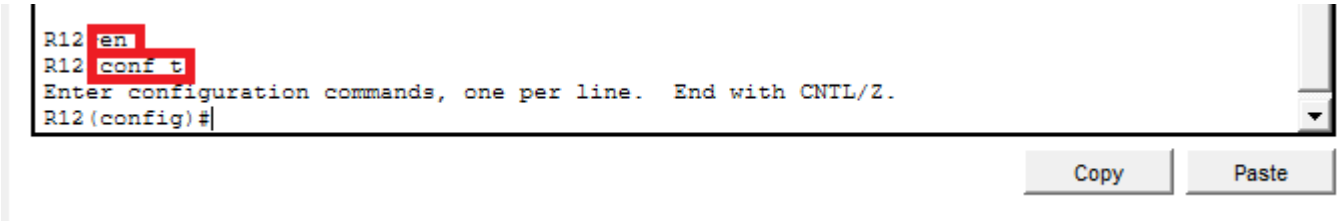
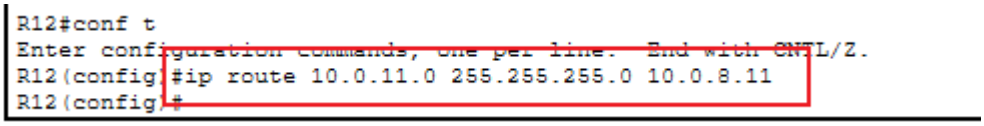
1. Configuration des routeurs R11 et R12

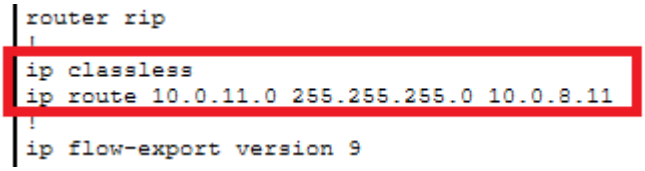
Depuis le routeur **R12** je vais dans l'onglet **CLI** puis je tape la commande **en** pour passer en mode privilégié et je tape la commande **conf t** pour pouvoir configurer le routeur



Puis je tape la commande **ip route 10.0.11.0 255.255.255.0 10.0.8.11** pour dire que je veux joindre le réseau **10.0.11.0** via la passerelle **10.0.8.11**



Une fois que le routeur **R12** est configuré je tape les commandes **exit** et **sh run** pour quitter la configuration et afficher la configuration en cours



En faisant la commande **sh ip route** on peut voir que la configuration qu'on a effectué a bien été pris en compte

```
R12#sh 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

     10.0.0.0/24 is subnetted, 3 subnets
C       10.0.8.0 is directly connected, FastEthernet0/0
S       10.0.11.0 [1/0] via 10.0.8.11
C       10.0.12.0 is directly connected, FastEthernet0/1

R12>
```

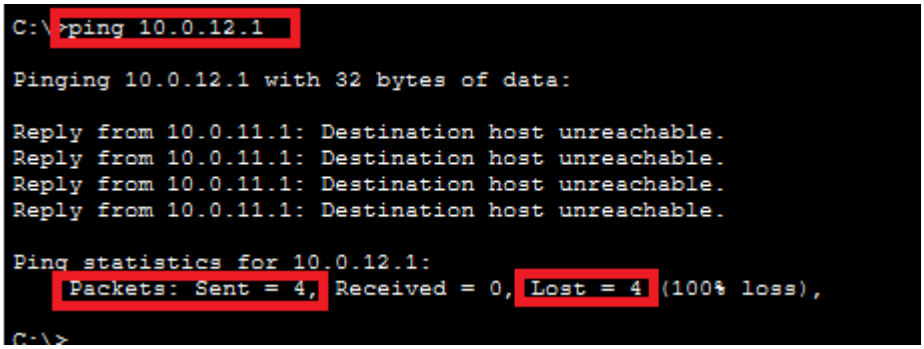
Et pour finir avec la commande **copy run start** j'enregistre les modifications

```
R12#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R12#
```

Depuis **PC 11** ,je ping le routeur **R12** et ils arrivent à se joindre entre eux

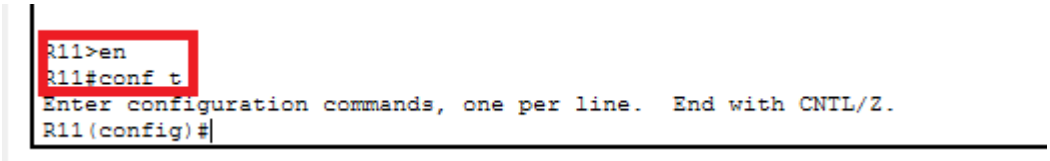
```
C:\>ping 10.0.8.12

Pinging 10.0.8.12 with 32 bytes of data:

Reply from 10.0.8.12: bytes=32 time<1ms TTL=254
Reply from 10.0.8.12: bytes=32 time<1ms TTL=254
Reply from 10.0.8.12: bytes=32 time<1ms TTL=254
Reply from 10.0.8.12: bytes=32 time<1ms TTL=254

Ping statistics for 10.0.8.12:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Lorsque j'essaie de ping le routeur **R12** côté **réseau 12** la machine n'arrive pas à joindre le routeur

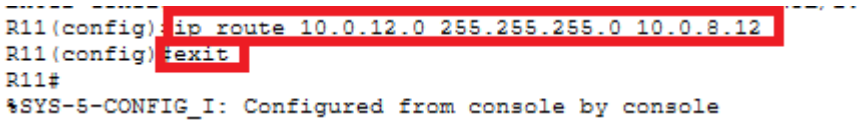


Pour cela on va devoir configurer le routeur R11

Sur le routeur R11 je vais dans l'onglet CLI et je tape les commandes **en** et **conf t** pour pouvoir le configurer



je fais la tape **ip route** pour pouvoir joindre le réseau 10.0.12.0 via la passerelle 10.0.8.12
et je fais **exit** pour quitter le mode de configuration



avec la commande **sh ip route** je regarde la configuration actuelle et je vérifie que il y a bien la route que j'ai configurée puis avec la commande **copy run start** j'enregistre la configuration

```
R1#sh 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

     10.0.0.0/24 is subnetted, 3 subnets
C       10.0.8.0 is directly connected, FastEthernet0/0
C       10.0.11.0 is directly connected, FastEthernet0/1
S       10.0.12.0 [1/0] via 10.0.8.12

R11#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R11#
```

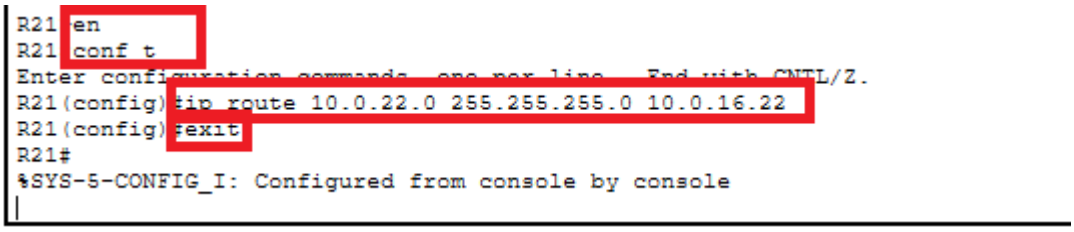
Cette-fois quand je refais un ping depuis **PC11** ça marche correctement

```
C:\>ping 10.0.12.1

Pinging 10.0.12.1 with 32 bytes of data:

Reply from 10.0.12.1: bytes=32 time=1ms TTL=254
Reply from 10.0.12.1: bytes=32 time<1ms TTL=254
Reply from 10.0.12.1: bytes=32 time<1ms TTL=254
Reply from 10.0.12.1: bytes=32 time<1ms TTL=254

Ping statistics for 10.0.12.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

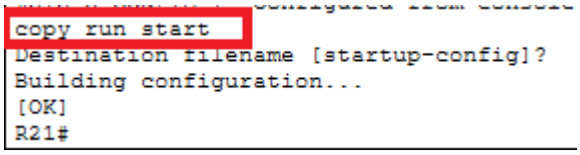
2.Configuration des Routeurs R21 et R22

Maintenant je vais faire la même chose avec **PC 21** et **PC 22** de sorte à ce qu'ils puissent se joindre entre eux

Sur le Routeur **R21**, dans l'onglet **CLI** je fais les commandes **en** pour pouvoir passer en mode privilégier et **conf t** pour pouvoir configurer le routeur.
Avec la commande **ip route** j'indique la route dans la table de routage puis je quitte le mode de configuration avec la commande **exit**



Ensuite j'enregistre la configuration avec la commande **copy run start**



Je fais la même chose pour le routeur **R22**

Je vais dans l'onglet **CLI** puis je tape les commandes **en** pour être en mode privilégié et **conf t** pour entrer dans le mode de configuration. Puis avec la commande **ip route** je tape **ip route 10.0.21.0 255.255.255.0 10.0.16.21** pour indiquer le chemin dans la table de routage

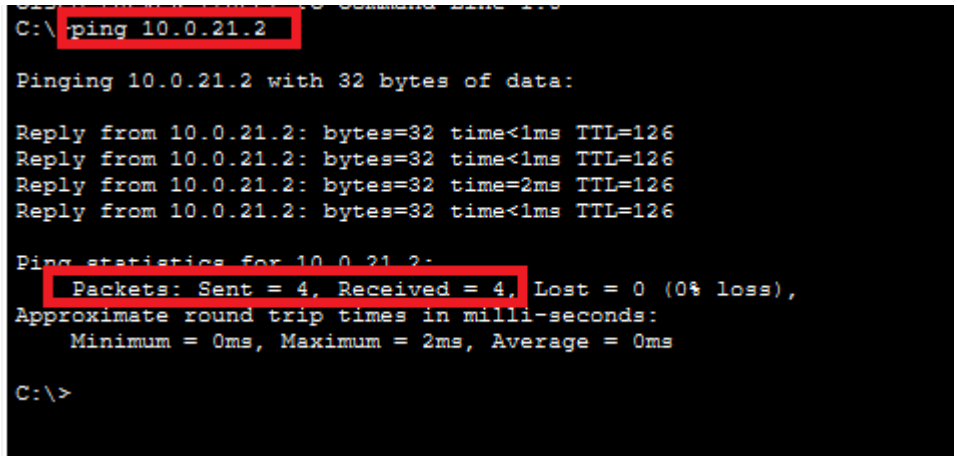
```
R22>en
R22#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R22(config)#ip route 10.0.21.0 255.255.255.0 10.0.16.21
R22(config)#exit
R22#
%SYS-5-CONFIG_I: Configured from console by console
```

```
sh 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

     10.0.0.0/24 is subnetted, 3 subnets
C       10.0.16.0 is directly connected, FastEthernet0/0
S       10.0.21.0 [1/0] via 10.0.16.21
C       10.0.22.0 is directly connected, FastEthernet0/1

R22#
```

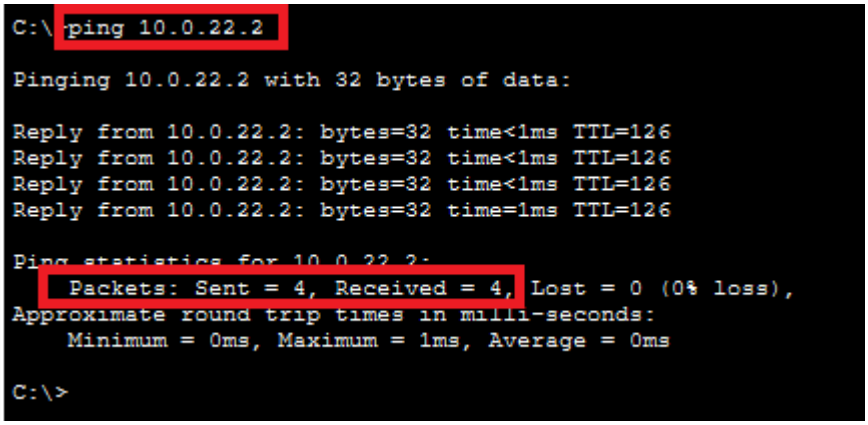
Je sauvegarde la configuration avec la commande **copy run start** pour enregistrer les modifications que j'ai effectuée

```
R22#
R22#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R22#
```

Ping depuis PC 22 vers PC 21



Ping depuis PC 21 vers PC 22



3. Configuration de tout les routeurs pour la connectivité générale

Connexion entre toutes les machines :

J'ai fait les mêmes procédures de sortes à ce que que tout les PC puissent se joindre entre elles

Routeur R11 :

```
R11#sh 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

     10.0.0.0/24 is subnetted, 5 subnets
C       10.0.8.0 is directly connected, FastEthernet0/0
C       10.0.11.0 is directly connected, FastEthernet0/1
S       10.0.12.0 [1/0] via 10.0.8.12
S       10.0.21.0 [1/0] via 10.0.8.8
S       10.0.22.0 [1/0] via 10.0.8.8

R11#
```

Routeur R12 :

```
R12#sh 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

     10.0.0.0/24 is subnetted, 5 subnets
C       10.0.8.0 is directly connected, FastEthernet0/0
S       10.0.11.0 [1/0] via 10.0.8.11
C       10.0.12.0 is directly connected, FastEthernet0/1
S       10.0.21.0 [1/0] via 10.0.8.8
S       10.0.22.0 [1/0] via 10.0.8.8

R12#
```

Routeur R8 :

```
R8#sh 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

     10.0.0.0/24 is subnetted, 7 subnets
C       10.0.1.0 is directly connected, FastEthernet0/0
C       10.0.2.0 is directly connected, Serial0/0/0
C       10.0.8.0 is directly connected, FastEthernet0/1
S       10.0.11.0 [1/0] via 10.0.8.11
S       10.0.12.0 [1/0] via 10.0.8.12
S       10.0.21.0 [1/0] via 10.0.2.16
S       10.0.22.0 [1/0] via 10.0.2.16

R8#
```

Routeur R16 :

```
R16#sh 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

     10.0.0.0/24 is subnetted, 7 subnets
C       10.0.1.0 is directly connected, FastEthernet0/0
C       10.0.2.0 is directly connected, Serial0/0/0
S       10.0.11.0 [1/0] via 10.0.2.8
S       10.0.12.0 [1/0] via 10.0.2.8
C       10.0.16.0 is directly connected, FastEthernet0/1
S       10.0.21.0 [1/0] via 10.0.16.21
S       10.0.22.0 [1/0] via 10.0.16.22

R16#
```

Routeur 21 :

```
R21#sh 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

     10.0.0.0/24 is subnetted, 5 subnets
S       10.0.11.0 [1/0] via 10.0.16.16
S       10.0.12.0 [1/0] via 10.0.16.16
C       10.0.16.0 is directly connected, FastEthernet0/0
C       10.0.21.0 is directly connected, FastEthernet0/1
S       10.0.22.0 [1/0] via 10.0.16.22

R21#
```

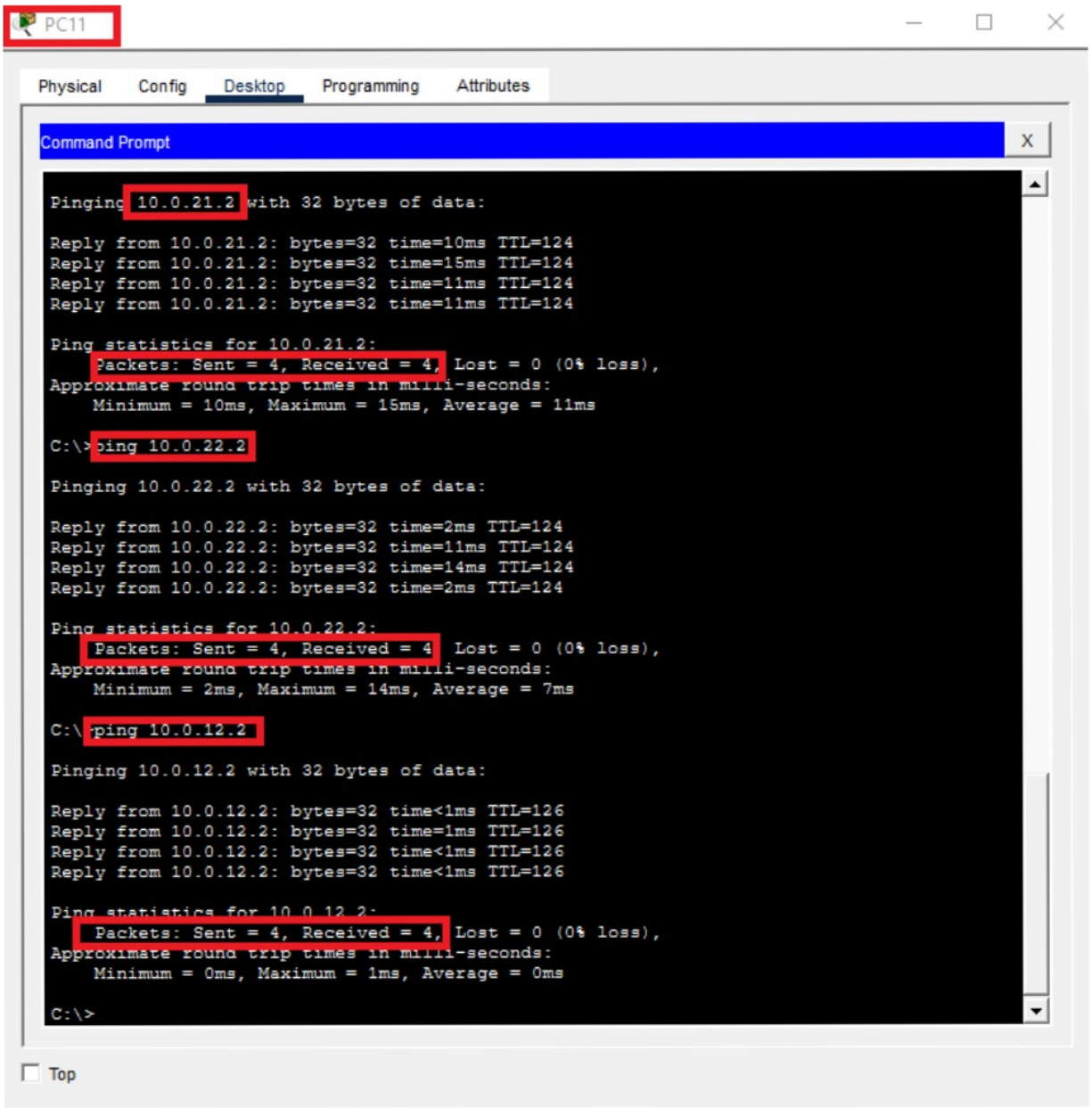
Routeur 22 :

```
R22#sh 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

     10.0.0.0/24 is subnetted, 5 subnets
S       10.0.11.0 [1/0] via 10.0.16.16
S       10.0.12.0 [1/0] via 10.0.16.16
C       10.0.16.0 is directly connected, FastEthernet0/0
S       10.0.21.0 [1/0] via 10.0.16.21
C       10.0.22.0 is directly connected, FastEthernet0/1

R22#
```

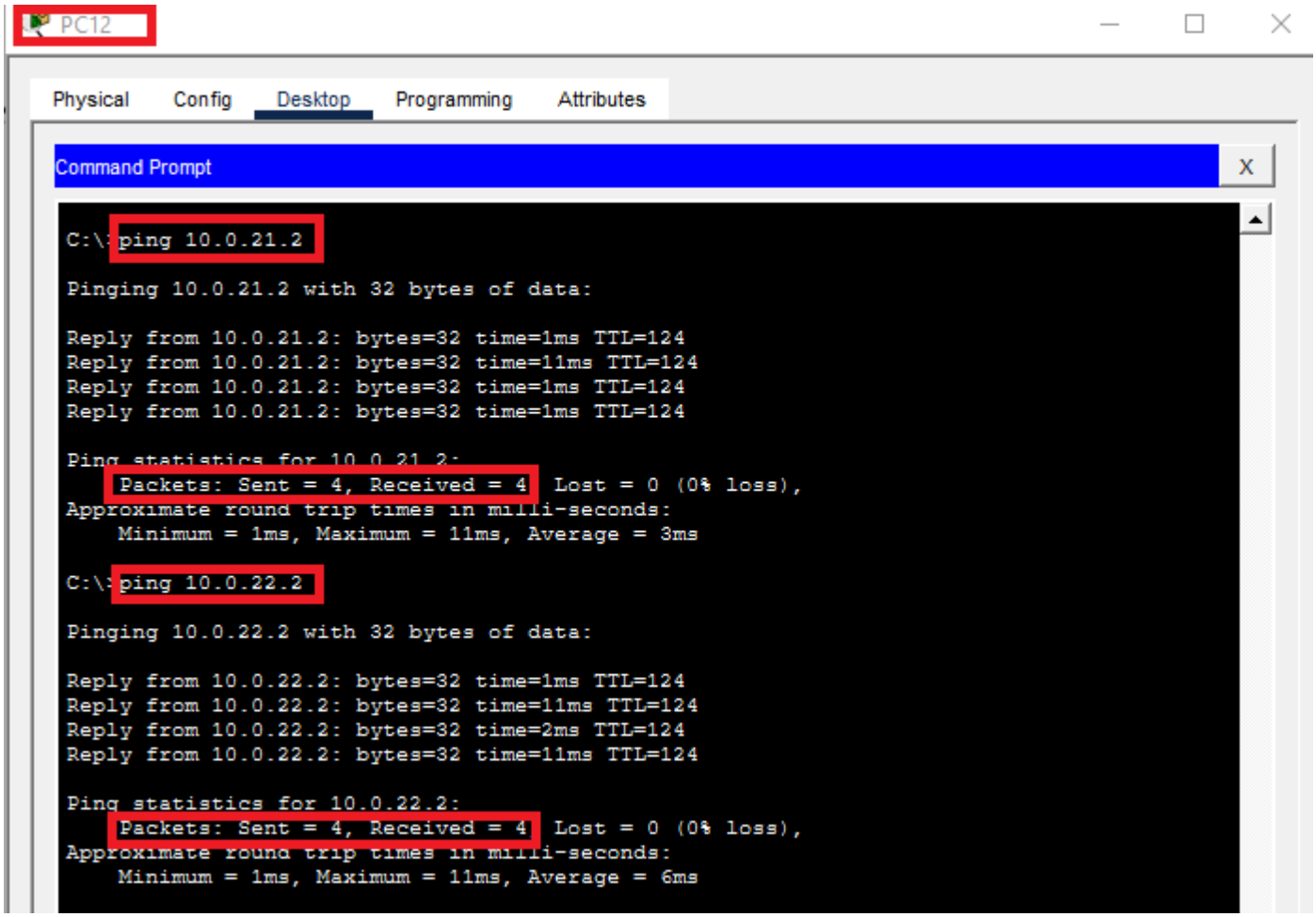
4. Test entre tous les PC

Ping entre toutes les machines :

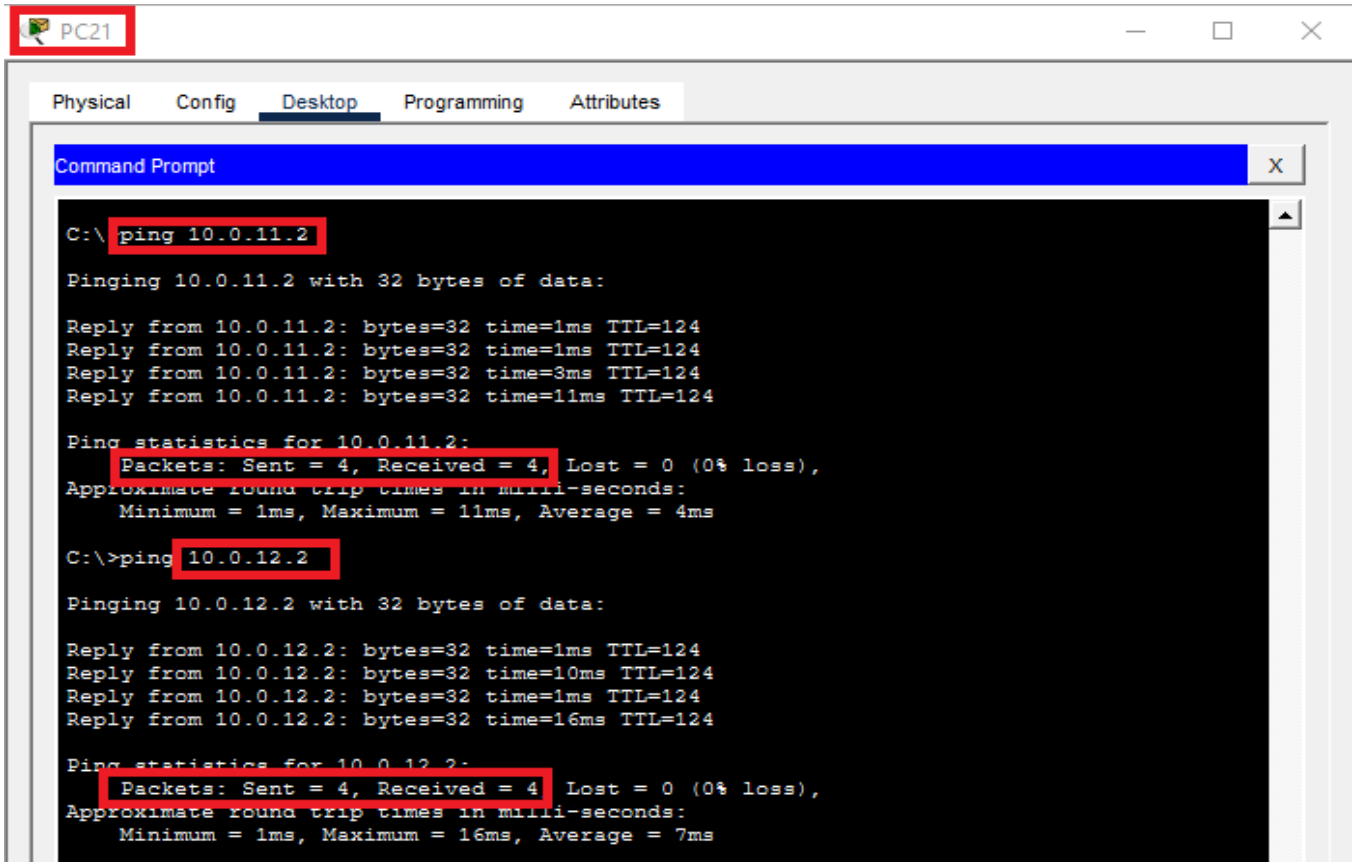
PC 11 :



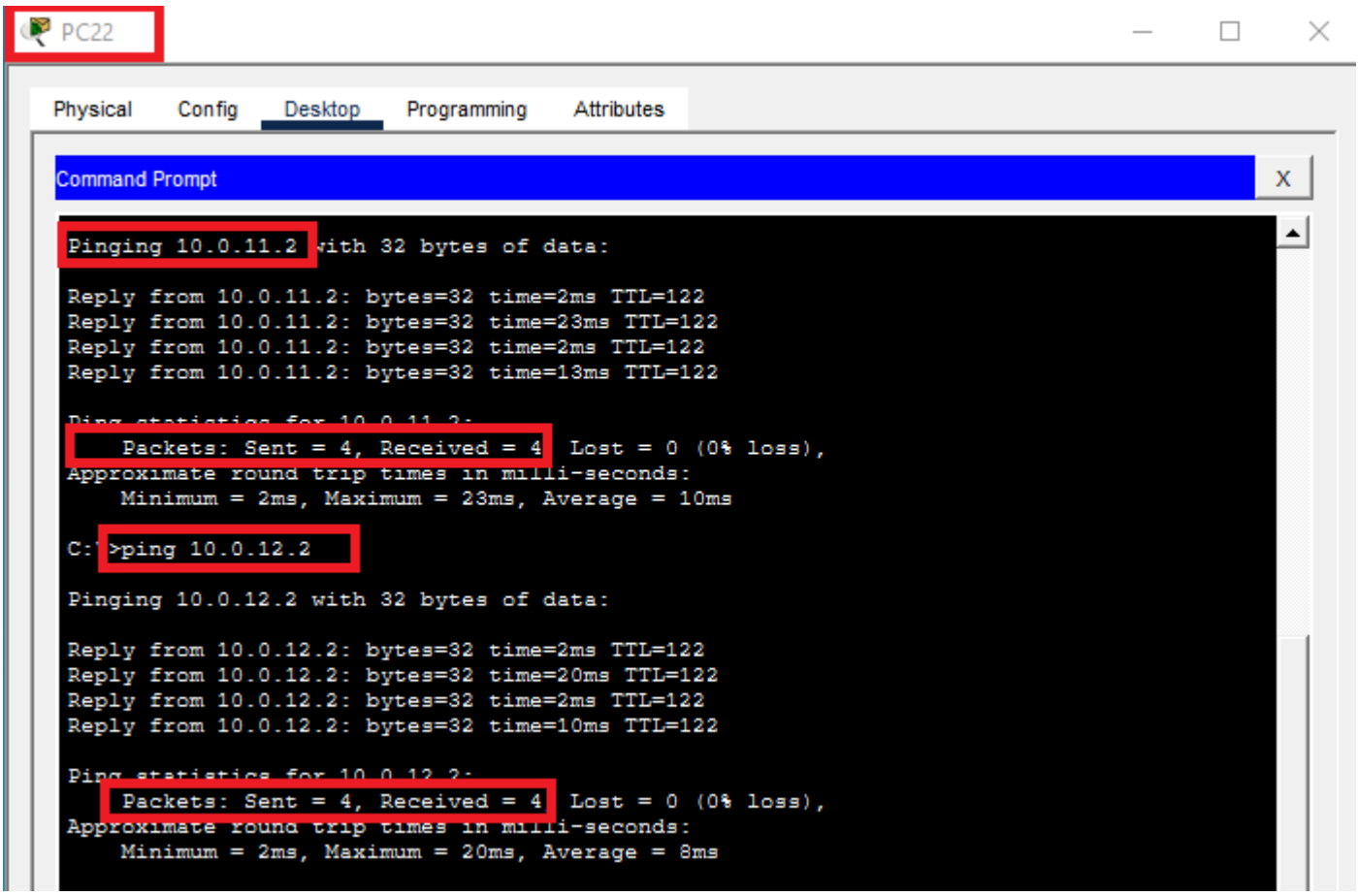
PC 12 :


PC12
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
C:\>ping 10.0.21.2
Pinging 10.0.21.2 with 32 bytes of data:
Reply from 10.0.21.2: bytes=32 time=1ms TTL=124
Reply from 10.0.21.2: bytes=32 time=11ms TTL=124
Reply from 10.0.21.2: bytes=32 time=1ms TTL=124
Reply from 10.0.21.2: bytes=32 time=1ms TTL=124
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 11ms, Average = 3ms
C:\>ping 10.0.22.2
Pinging 10.0.22.2 with 32 bytes of data:
Reply from 10.0.22.2: bytes=32 time=1ms TTL=124
Reply from 10.0.22.2: bytes=32 time=11ms TTL=124
Reply from 10.0.22.2: bytes=32 time=2ms TTL=124
Reply from 10.0.22.2: bytes=32 time=11ms TTL=124
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 11ms, Average = 6ms

PC 21 :


PC21
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
C:\ ping 10.0.11.2
Pinging 10.0.11.2 with 32 bytes of data:
Reply from 10.0.11.2: bytes=32 time=1ms TTL=124
Reply from 10.0.11.2: bytes=32 time=1ms TTL=124
Reply from 10.0.11.2: bytes=32 time=3ms TTL=124
Reply from 10.0.11.2: bytes=32 time=11ms TTL=124
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Minimum = 1ms, Maximum = 11ms, Average = 4ms
C:\>ping 10.0.12.2
Pinging 10.0.12.2 with 32 bytes of data:
Reply from 10.0.12.2: bytes=32 time=1ms TTL=124
Reply from 10.0.12.2: bytes=32 time=10ms TTL=124
Reply from 10.0.12.2: bytes=32 time=1ms TTL=124
Reply from 10.0.12.2: bytes=32 time=16ms TTL=124
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Minimum = 1ms, Maximum = 16ms, Average = 7ms

PC 22 :


PC22
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Pinging 10.0.11.2 with 32 bytes of data:
Reply from 10.0.11.2: bytes=32 time=2ms TTL=122
Reply from 10.0.11.2: bytes=32 time=23ms TTL=122
Reply from 10.0.11.2: bytes=32 time=2ms TTL=122
Reply from 10.0.11.2: bytes=32 time=13ms TTL=122
Packets: Sent = 4, Received = 4 Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 23ms, Average = 10ms
C:\>ping 10.0.12.2
Pinging 10.0.12.2 with 32 bytes of data:
Reply from 10.0.12.2: bytes=32 time=2ms TTL=122
Reply from 10.0.12.2: bytes=32 time=20ms TTL=122
Reply from 10.0.12.2: bytes=32 time=2ms TTL=122
Reply from 10.0.12.2: bytes=32 time=10ms TTL=122
Packets: Sent = 4, Received = 4 Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 20ms, Average = 8ms