Dersim Besiktas

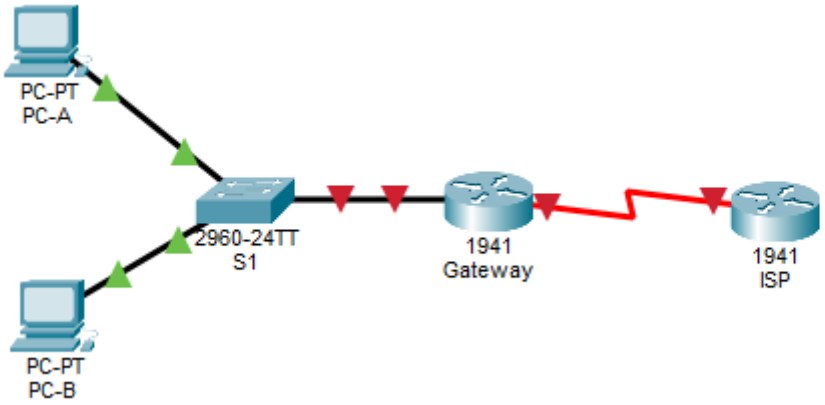
Configuration de la fonction NAT dynamique et statique

SOMMAIRE

Partie 1: Création du réseau et vérification de la connectivité

Étape 1: Câblez le réseau conformément à la topologie

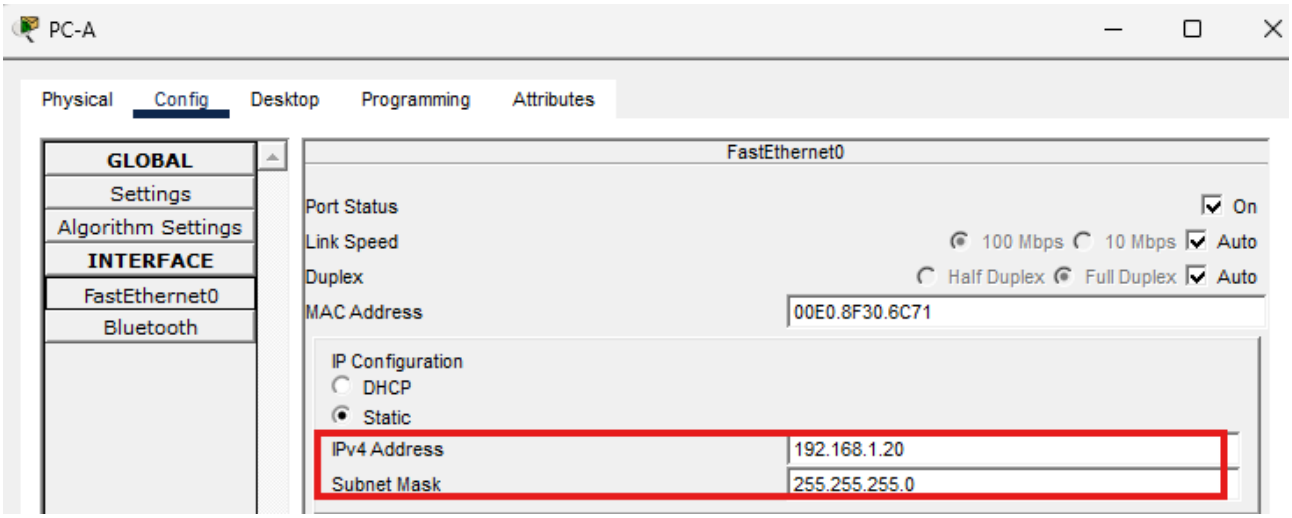
Je câble le réseau conformément à la topologie



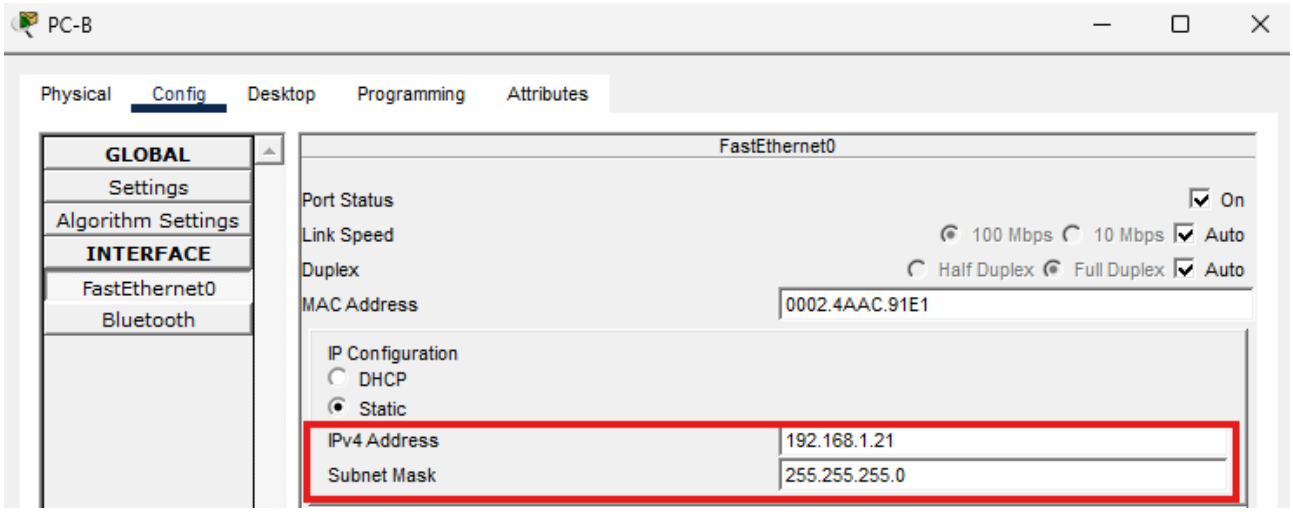
Étape 2: Configurez les hôtes de PC

Je configure les PC-A et PC-B

PC-A :



PC-B :



Étape 3: Configurez les paramètres de base pour chaque routeur

Configuration de la Gateway :

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#int g0/1
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#int s0/0/1
Router(config-if)#ip address 209.165.201.18 255.255.255.252
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
Router(config-if)#exit
Router(config)#hostname Gateway
Gateway(config)#line vty 0 4
Gateway(config-line)#password cisco
Gateway(config-line)#login
Gateway(config-line)#logging synchronous
Gateway(config-line)#exit
Gateway(config)#enable secret class
Gateway(config)#
```

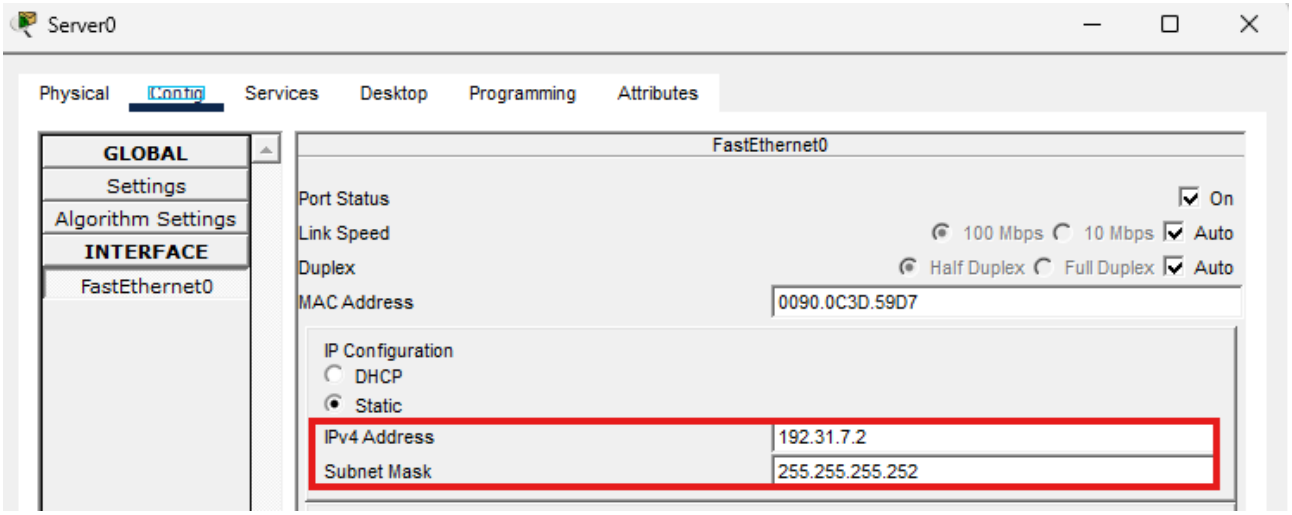
Configuration de l'ISP :

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#no ip domain-lookup
Router(config)#int s0/0/0
Router(config-if)#ip address 209.165.201.17 255.255.255.252
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Router(config-if)#exit
Router(config)#hostname ISP
ISP(config)#line vty 0 4
ISP(config-line)#password cisco
ISP(config-line)#login
ISP(config-line)#logging synchronous
ISP(config-line)#exit
```

```
ISP(config)#enable secret class
ISP(config)#int s0/0/0
ISP(config-if)#clock rate 128000
ISP(config-if)#
```

Étape 5: Ajouter un serveur 192.31.7.2/30

Je configure le Serveur conformément à la topologie



Étape 6: Configurez le routage statique

Je créer une route statique depuis le routeur ISP

```
ISP#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
ISP(config)#ip route 209.165.200.224 255.255.255.224 209.165.201.18
ISP(config)#
```

Je créer une route par défaut sur le routeur de passerelle

```
Gateway#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Gateway(config)#ip route 0.0.0.0 0.0.0.0 209.165.201.17
Gateway(config)#
```

Étape 7: Enregistrez la configuration en cours en tant que configuration initiale

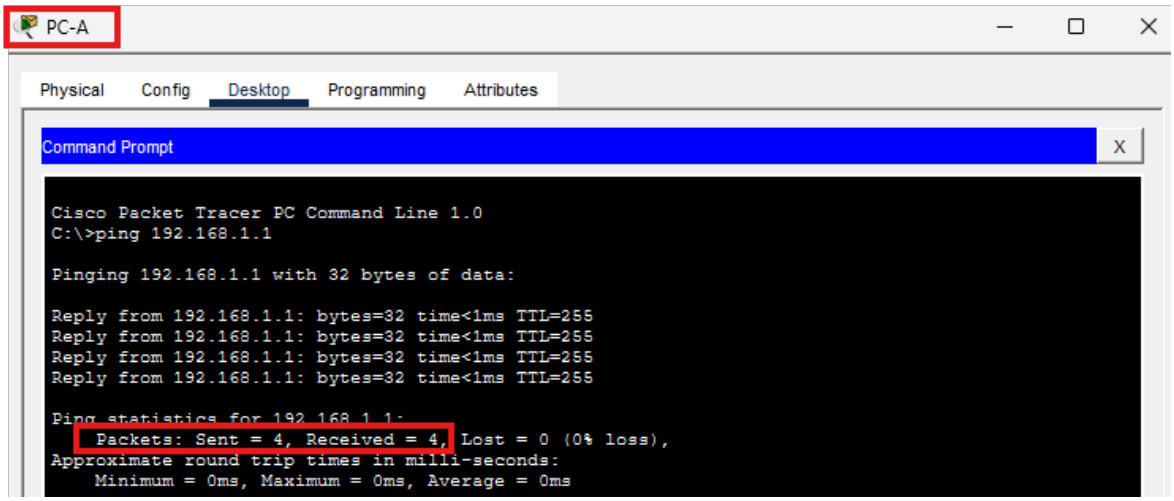
Je sauvegarde la configuration en cours

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

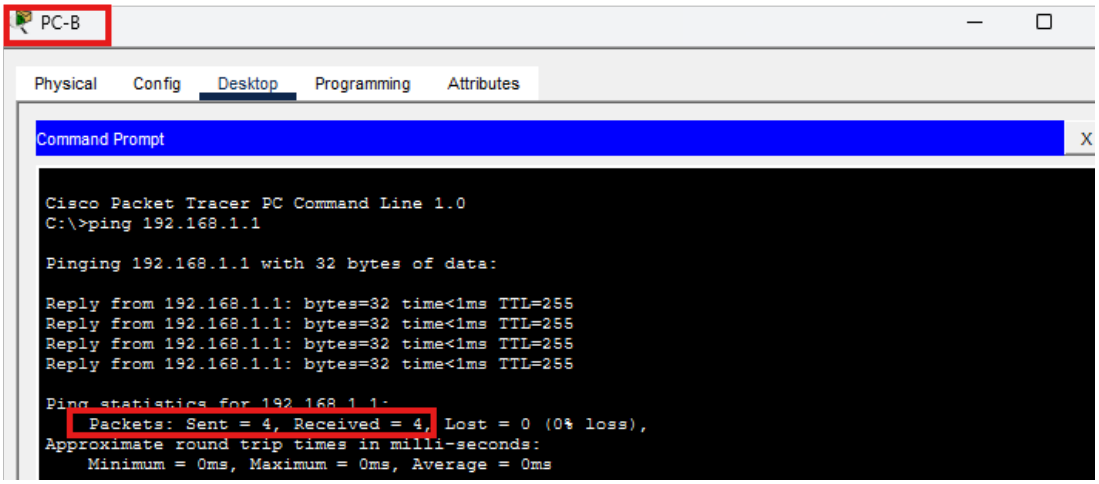
Étape 8: Vérifiez la connectivité du réseau

Depuis les PC j’envoie une requête ping à l’interface G0/1

Depuis PC-A :



Depuis PC-B :



J’affiche la table de routage des deux routeurs Gateway et ISP

Gateway :

```
Gateway#sh 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, 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 209.165.201.17 to network 0.0.0.0

     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, GigabitEthernet0/1
     209.165.201.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.165.201.16/30 is directly connected, Serial0/0/1
L       209.165.201.18/32 is directly connected, Serial0/0/1
S*   0.0.0.0/0 [1/0] via 209.165.201.17

Gateway#
```

ISP :

```
ISP#sh 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, 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

     209.165.200.0/27 is subnetted, 1 subnets
S       209.165.200.224/27 [1/0] via 209.165.201.18
     209.165.201.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.165.201.16/30 is directly connected, Serial0/0/0
L       209.165.201.17/32 is directly connected, Serial0/0/0

ISP#
```

Partie 2: Configuration et vérification de la fonction NAT statique

Étape 1: Configurez un mappage statique

Je configure un mappage statique qui permet d'accéder à internet depuis PC-A

```
Gateway(config)#ip nat inside source static 192.168.1.20 209.165.200.225
Gateway(config)#
```

Étape 2: Indiquez les interfaces

Je détermine les interfaces d'entrée et de sortie

```
Gateway(config)#int g0/1
Gateway(config-if)#ip nat inside
Gateway(config-if)#int s0/0/1
Gateway(config-if)#int s0/0/1
Gateway(config-if)#ip nat outside
Gateway(config-if)#
```

Étape 3: Testez la configuration

J’affiche la table NAT statique

```
Gateway#sh ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
---  209.165.200.225   192.168.1.20       ---                ---
```

Depuis PC-A j’envoie un ping au Serveur

```
C:\>ping 192.31.7.2

Pinging 192.31.7.2 with 32 bytes of data:

Reply from 192.31.7.2: bytes=32 time=9ms TTL=126
Reply from 192.31.7.2: bytes=32 time=6ms TTL=126
Reply from 192.31.7.2: bytes=32 time=6ms TTL=126
Reply from 192.31.7.2: bytes=32 time=7ms TTL=126

Ping statistics for 192.31.7.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 9ms, Average = 7ms

C:\>
```

Depuis le Routeur Gateway j’affiche la table NAT

```
Gateway#sh ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
icmp 209.165.200.225:30192.168.1.20:30    192.31.7.2:30      192.31.7.2:30
icmp 209.165.200.225:31192.168.1.20:31    192.31.7.2:31      192.31.7.2:31
icmp 209.165.200.225:32192.168.1.20:32    192.31.7.2:32      192.31.7.2:32
icmp 209.165.200.225:33192.168.1.20:33    192.31.7.2:33      192.31.7.2:33
---  209.165.200.225   192.168.1.20       ---                ---

Gateway#
```

Depuis le routeur ISP j’envoie un ping vers PC-A à l’adresse publique

```
ISP#ping 209.165.200.225

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.225, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 6/7/9 ms
```

J’affiche la table NAT depuis le Routeur Gateway

```
Gateway#sh ip nat translations
Pro  Inside global     Inside local       Outside local      Outside global
icmp 209.165.200.225:26192.168.1.20:26    209.165.201.17:26  209.165.201.17:26
icmp 209.165.200.225:27192.168.1.20:27    209.165.201.17:27  209.165.201.17:27
icmp 209.165.200.225:28192.168.1.20:28    209.165.201.17:28  209.165.201.17:28
icmp 209.165.200.225:29192.168.1.20:29    209.165.201.17:29  209.165.201.17:29
icmp 209.165.200.225:30192.168.1.20:30    209.165.201.17:30  209.165.201.17:30
---  209.165.200.225    192.168.1.20       ---                ---
```

Je tape la commande **sh ip nat statistics** pour vérifier les statistiques NAT

```
Gateway#sh ip nat statistics
Total translations: 6 (1 static, 5 dynamic, 5 extended)
Outside Interfaces: Serial0/0/1
Inside Interfaces: GigabitEthernet0/1
Hits: 83  Misses: 118
Expired translations: 55
Dynamic mappings:
Gateway#
```

Partie 3: Configuration et vérification de la fonction NAT dynamique

Étape 1: Effacez les traductions NAT

J’efface les traductions NAT

```
Gateway#clear ip nat translation *
Gateway#
```

Étape 2: Définissez une liste de contrôle d'accès correspondant à la plage d'adresses IP privées du LAN

Je définie une liste de contrôle d’accès

```
Gateway(config)#access-list 1 permit 192.168.1.0 0.0.0.255
Gateway(config)#
```

Étape 3: Vérifiez que les configurations d'interface NAT sont toujours valides

```
Gateway#sh ip nat statistics
Total translations: 1 (1 static, 0 dynamic, 0 extended)
Outside Interfaces: Serial0/0/1
Inside Interfaces: GigabitEthernet0/1
Hits: 83  Misses: 118
Expired translations: 60
Dynamic mappings:
Gateway#
```

Étape 4: Définissez le pool d'adresses IP publiques utilisables

Je définie le pool d’adresse IP publique utilisables

```
Gateway(config)#ip nat pool public_access 209.165.200.242 209.165.200.254 netmask
255.255.255.224
Gateway(config)#
```

Étape 5: Définissez la NAT à partir de la liste source interne vers le groupe externe

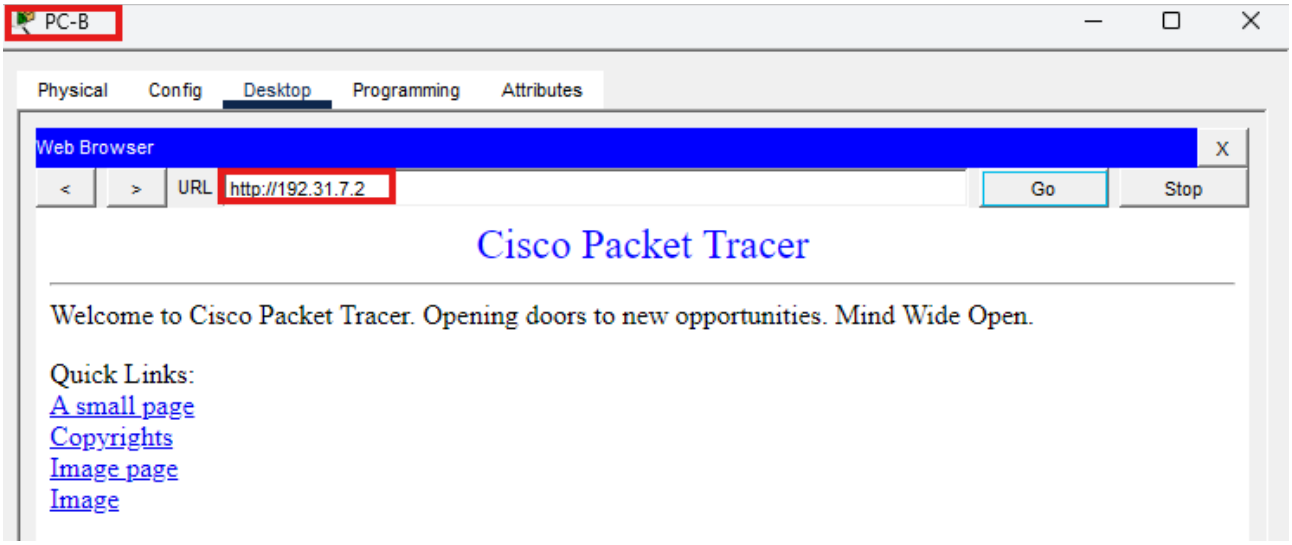
```
Gateway(config)#ip nat inside source list 1 pool public_access
Gateway(config)#
```

Étape 6: Testez la configuration

Depuis PC-B je ping le Serveur

```
C:\>ping 192.31.7.2

Pinging 192.31.7.2 with 32 bytes of data:

Reply from 192.31.7.2: bytes=32 time=9ms TTL=126
Reply from 192.31.7.2: bytes=32 time=17ms TTL=126
Reply from 192.31.7.2: bytes=32 time=4ms TTL=126
Reply from 192.31.7.2: bytes=32 time=6ms TTL=126

Ping statistics for 192.31.7.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 17ms, Average = 9ms
```

Depuis PC-B j’ouvre un navigateur et j’entre l’adresse IP du Serveur



J’affiche la table de translation NAT depuis le routeur Gateway

```
Gateway#sh ip nat translation
Pro  Inside global     Inside local       Outside local      Outside global
---  209.165.200.225   192.168.1.20       ---                ---
tcp 209.165.200.242:1025192.168.1.21:1025  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1026192.168.1.21:1026  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1027192.168.1.21:1027  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1028192.168.1.21:1028  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1029192.168.1.21:1029  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1030192.168.1.21:1030  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1031192.168.1.21:1031  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1032192.168.1.21:1032  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1033192.168.1.21:1033  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1034192.168.1.21:1034  192.31.7.2:80      192.31.7.2:80
tcp 209.165.200.242:1035192.168.1.21:1035  192.31.7.2:80      192.31.7.2:80

Gateway#
```

J’affiche les statistiques NAT depuis le routeur Gateway

```
Gateway#sh ip nat statistics
Total translations: 12 (1 static, 11 dynamic, 11 extended)
Outside Interfaces: Serial0/0/1
Inside Interfaces: GigabitEthernet0/1
Hits: 224  Misses: 145
Expired translations: 76
Dynamic mappings:
-- Inside Source
access-list 1 pool public_access refCount 11
 pool public_access: netmask 255.255.255.224
       start 209.165.200.242 end 209.165.200.254
       type generic, total addresses 13 , allocated 1 (7%), misses 0
Gateway#
```

Étape 7: Supprimez l'entrée NAT statique

Je supprime l’entrée NAT statique

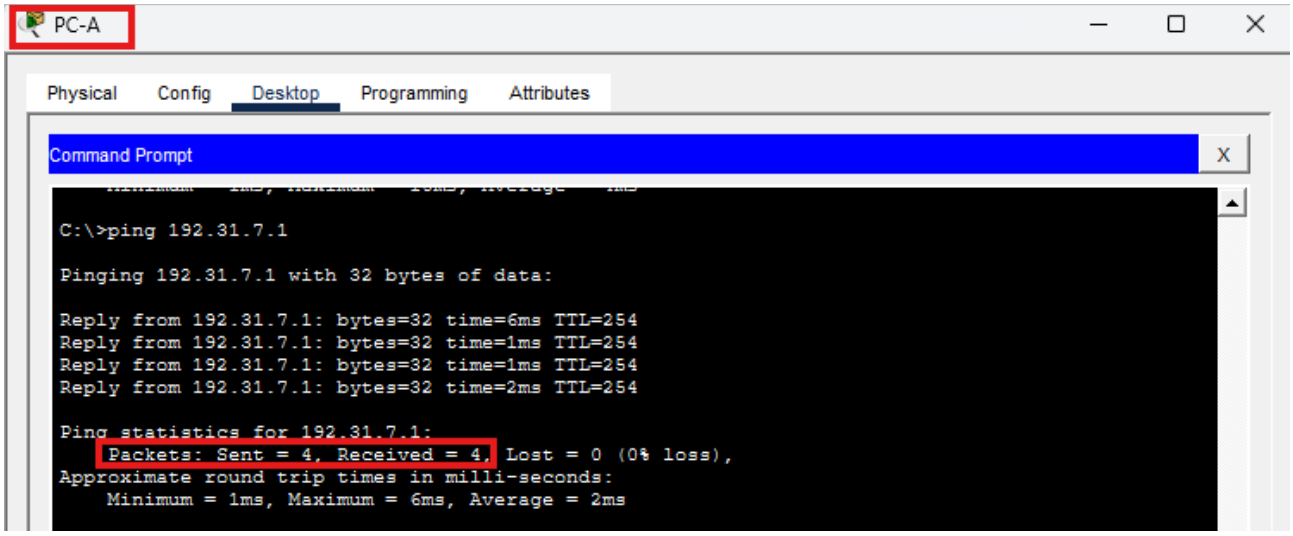
```
Gateway(config)#no ip nat inside source static 192.168.1.20 209.165.200.225
Gateway(config)#
```

Je vide de nouveau la table NAT

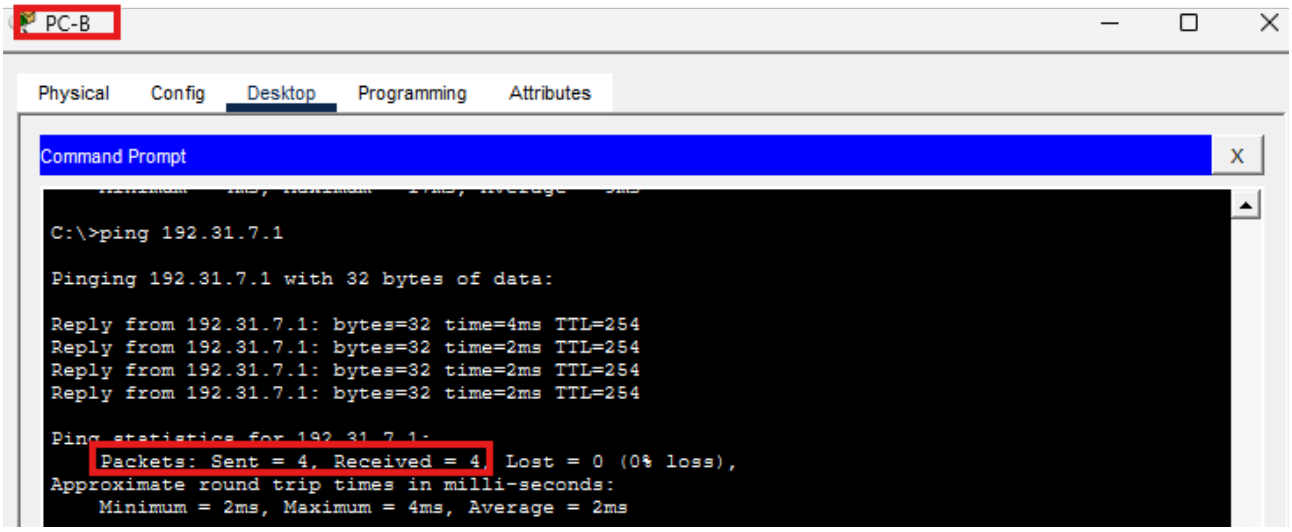
```
Gateway#clear ip nat translation *
Gateway#
```

Je ping le routeur ISP depuis les deux PC :

PC-A :



PC-B :



J’affiche la table NAT et statistiques

```
Gateway#sh ip nat statistics
Total translations: 8 (0 static, 8 dynamic, 8 extended)
Outside Interfaces: Serial0/0/1
Inside Interfaces: GigabitEthernet0/1
Hits: 240  Misses: 161
Expired translations: 84
Dynamic mappings:
-- Inside Source
access-list 1 pool public_access refCount 8
 pool public_access: netmask 255.255.255.224
       start 209.165.200.242 end 209.165.200.254
       type generic, total addresses 13 , allocated 2 (15%), misses 0
Gateway#
```

```
Gateway#sh ip nat translation
Pro  Inside global     Inside local       Outside local      Outside global
icmp 209.165.200.244:59192.168.1.20:59    192.31.7.1:59      192.31.7.1:59
icmp 209.165.200.244:60192.168.1.20:60    192.31.7.1:60      192.31.7.1:60
icmp 209.165.200.244:61192.168.1.20:61    192.31.7.1:61      192.31.7.1:61
icmp 209.165.200.244:62192.168.1.20:62    192.31.7.1:62      192.31.7.1:62
icmp 209.165.200.245:21192.168.1.21:21    192.31.7.1:21      192.31.7.1:21
icmp 209.165.200.245:22192.168.1.21:22    192.31.7.1:22      192.31.7.1:22
icmp 209.165.200.245:23192.168.1.21:23    192.31.7.1:23      192.31.7.1:23
icmp 209.165.200.245:24192.168.1.21:24    192.31.7.1:24      192.31.7.1:24
```