Dersim Besiktas

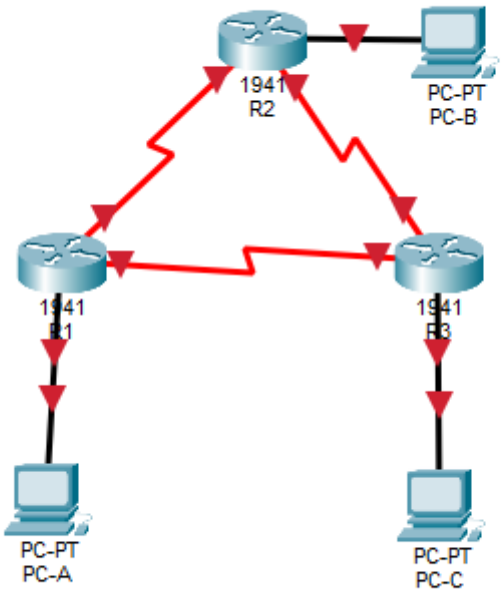
configuration du protocole OSPFv2 de base dans une zone unique

SOMMAIRE

Partie 1 : Création du réseau et configuration des paramètres de base du périphérique

Étape 1 : Câblez le réseau conformément à la topologie.

Je fais la topologie comme sur le shéma



Étape 2 : Configurez les paramètres de base pour chaque routeur

Je mets un mot de passe pour le mode privilégié

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#enable secret class
Router(config)#
```

Je désactive la recherche DNS

```
Router(config)#no ip domain-lookup
Router(config)#
```

Je change le nom du routeur

```
Router(config)#hostname R1
R1(config)#
```

Je mets une bannière MOTD

```
R1(config)#banner motd #Configuration modifiee#
R1(config)#
```

J’attribue un mot de passe pour vty

```
R1(config)#line vty 0 4
R1(config-line)#password cisco
R1(config-line)#login
R1(config-line)#exec-timeout 5 0
R1(config-line)#logging synchronous
R1(config-line)#exit
R1(config)#
```

Configuration de l’interface g0/0

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int g0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shut

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
```

Configuration de l interface S0/0/0

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int s0/0/0
R1(config-if)#ip address 192.168.12.1 255.255.255.252
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#
```

Configuration de l’interface S0/0/1

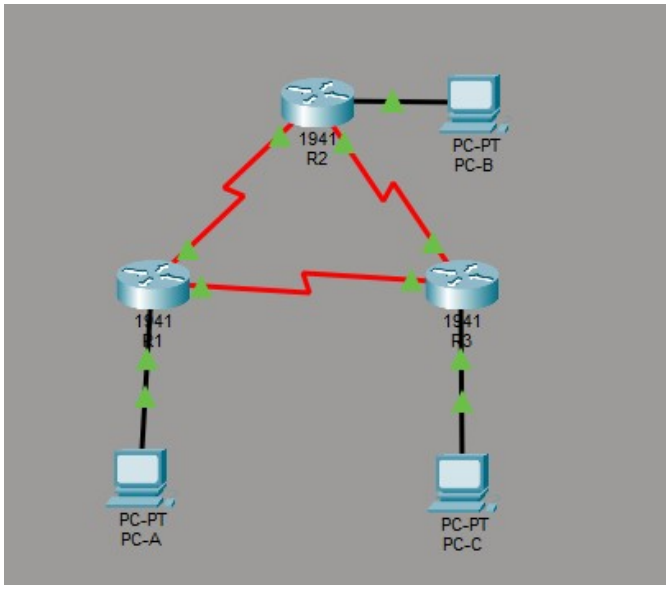
```
R1(config-if)#int s0/0/1
R1(config-if)#ip address 192.168.13.1 255.255.255.252
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R1(config-if)#
R1(config-if)#
```

Je défini la fréquence d'horloge

```
R1(config-if)#clock rate 128000
R1(config-if)#
```

Je configure de la même facon les routeurs R2 et R3



R1 :

```
R1#sh ip int br
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     192.168.1.1     YES NVRAM  up                    up
GigabitEthernet0/1     unassigned      YES NVRAM  administratively down down
Serial0/0/0            192.168.12.1    YES NVRAM  up                    up
Serial0/0/1            192.168.13.1    YES NVRAM  up                    up
Vlan1                  unassigned      YES NVRAM  administratively down down
R1#
```

R2 :

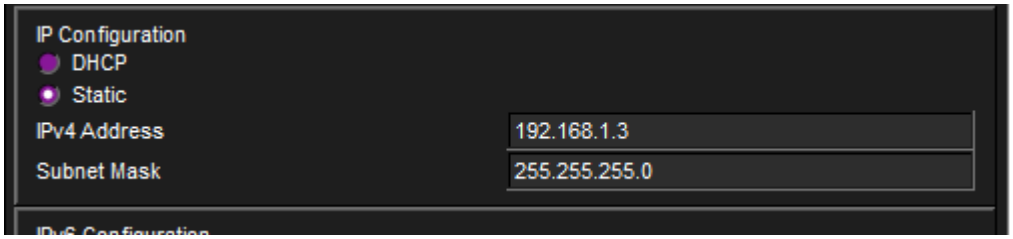
```
R2#sh ip int br
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     192.168.2.1     YES NVRAM  up                    up
GigabitEthernet0/1     unassigned      YES NVRAM  administratively down down
Serial0/0/0            192.168.12.2    YES NVRAM  up                    up
Serial0/0/1            192.168.23.1    YES NVRAM  up                    up
Vlan1                  unassigned      YES NVRAM  administratively down down
R2#
```

R3 :

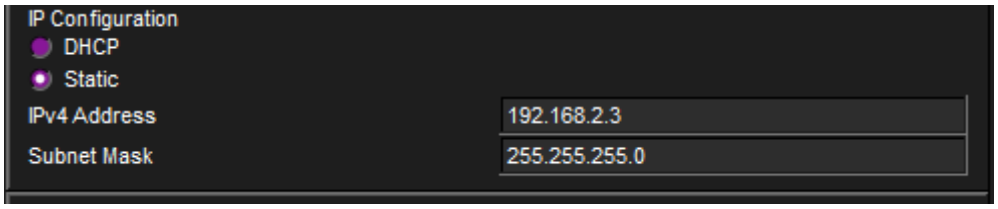
```
R3#sh ip int br
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0     192.168.3.1     YES manual up                    up
GigabitEthernet0/1     unassigned      YES unset  administratively down down
Serial0/0/0            192.168.13.2    YES manual up                    up
Serial0/0/1            192.168.23.2    YES manual up                    up
Vlan1                  unassigned      YES unset  administratively down down
R3#
```

Étape 3 : Configurez les hôtes de PC.

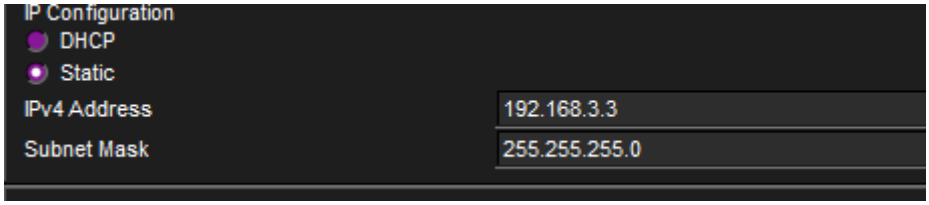
PC A :



PC B :

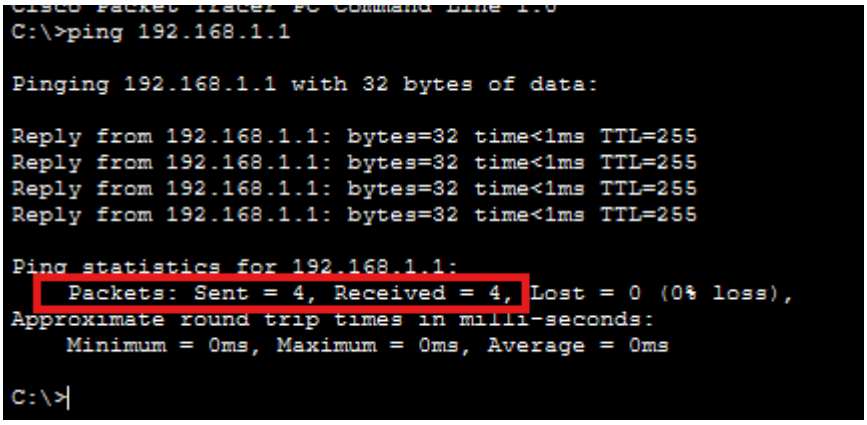


PC C :

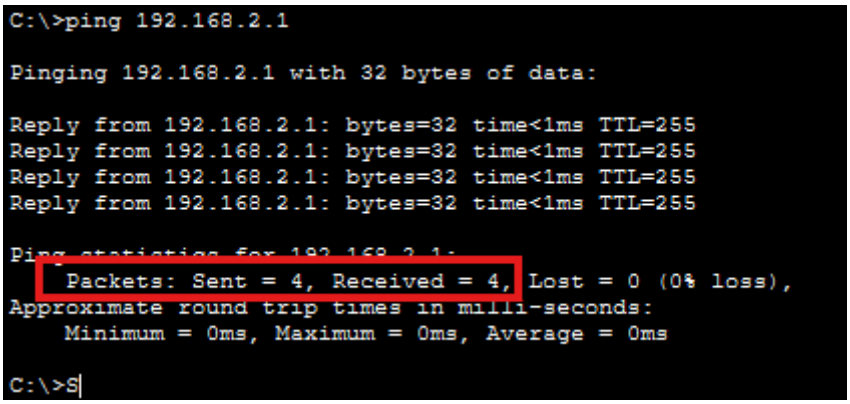


Étape 5 : Testez la connectivité.

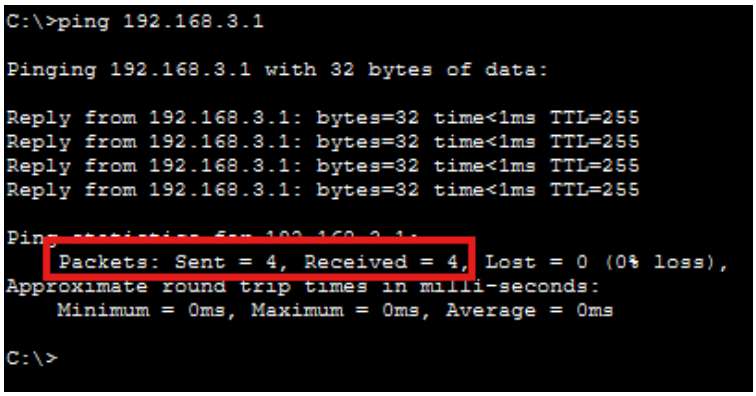
Ping PC A vers R1



Ping PC B vers R2



Ping PC C vers R3



Ping R1 vers R2

```
R1#ping 192.168.12.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.12.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/24 ms

R1#
```

Ping R3 vers R2

```
R3#ping 192.168.13.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.13.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/5/12 ms

R3#
```

Partie 2 : Configuration et vérification du routage OSPF

Étape 1 : Configurez le protocole OSPF sur R1

J'active le protocole OSPF sur R1

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#network 192.168.1.0 0.0.0.255 area 0
R1(config-router)#network 192.168.12.0 0.0.0.3 area 0
R1(config-router)#network 192.168.13.0 0.0.0.3 area 0
```

Étape 2 : Configurez le protocole OSPF sur R2 et R3

R2 :

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#network 192.168.2.0 0.0.0.255 area 0
R2(config-router)#network 192.168.12.0 0.0.0.3 area 0


 R2(config-router)#network 192.168.23.0 0.0.0.3 area 0
 R2(config-router)#
```

R3 :

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#router ospf 1
R3(config-router)#network 192.168.3.0 0.0.0.255 area 0
R3(config-router)#network 192.168.13.0 0.0.0.3 area 0
R3(config-router)#network 192.168.23.0 0.0.0.3 area 0
```

Étape 3 : Vérifiez les voisins OSPF et les informations de routage

Les voisins de R1

```
R1#show ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.23.1      0   FULL/  -        00:00:30    192.168.12.2    Serial0/0/0
192.168.23.2      0   FULL/  -        00:00:37    192.168.13.2    Serial0/0/1
R1#
```

Les voisins de R2

```
R2#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.13.1      0   FULL/  -        00:00:30    192.168.12.1    Serial0/0/0
192.168.23.2      0   FULL/  -        00:00:38    192.168.23.2    Serial0/0/1
R2#
```

Les voisins de R3

```
R3#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.13.1      0   FULL/  -        00:00:39    192.168.13.1    Serial0/0/0
192.168.23.1      0   FULL/  -        00:00:37    192.168.23.1    Serial0/0/1
R3#
```

Étape 5 : Vérifier les informations de processus OSPF

```
R1#sh ip ospf
 Routing Process "ospf 1" with ID 192.168.13.1
 Supports only single TOS(TOS0) routes
 Supports opaque LSA
 SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
 Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
 Number of external LSA 0. Checksum Sum 0x000000
 Number of opaque AS LSA 0. Checksum Sum 0x000000
 Number of DCbitless external and opaque AS LSA 0
 Number of DoNotAge external and opaque AS LSA 0
 Number of areas in this router is 1. 1 normal 0 stub 0 nssa
 External flood list length 0
    Area BACKBONE(0)
        Number of interfaces in this area is 3
        Area has no authentication
        SPF algorithm executed 7 times
        Area ranges are
        Number of LSA 3. Checksum Sum 0x00c59a
        Number of opaque link LSA 0. Checksum Sum 0x000000
        Number of DCbitless LSA 0
        Number of indication LSA 0
        Number of DoNotAge LSA 0
        Flood list length 0
 --More--
```

Étape 6 : Vérifier les paramètres d'interface OSPF

```
R1# sh ip ospf int br
Interface     PID   Area                    IP Address/Mask          Cost  State  Nbrs
F/C
Gig0/0          1   0                     192.168.1.1/255.255.255.0   1       DR  0/0
Se0/0/0         1   0                   192.168.12.1/255.255.255.252  64    POINT  0/0
Se0/0/1         1   0                   192.168.13.1/255.255.255.252  64    POINT  0/0
```

Étape 7 : Vérifiez la connectivité de bout en bout.

Ping PC A vers PC B

```
C:\>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=7ms TTL=126
Reply from 192.168.2.3: bytes=32 time=1ms TTL=126
Reply from 192.168.2.3: bytes=32 time=1ms TTL=126
Reply from 192.168.2.3: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 7ms, Average = 2ms
```

Ping PC A vers PC C

```
C:\>ping 192.168.3.3

Pinging 192.168.3.3 with 32 bytes of data:

Reply from 192.168.3.3: bytes=32 time=9ms TTL=126
Reply from 192.168.3.3: bytes=32 time=8ms TTL=126
Reply from 192.168.3.3: bytes=32 time=1ms TTL=126
Reply from 192.168.3.3: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.3.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 9ms, Average = 4ms

C:\>
```

Partie 3 : Modification des attributions d'ID de routeur

Étape 1 : Modifiez les ID de routeur en utilisant des adresses de bouclage.

J’attribue une adresse IP au blouclage 0 sur R1

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int lo0
R1(config-if)#ip address 1.1.1.1 255.255.255.255
R1(config-if)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

R2

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int lo0
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
```

R3

```
R3(config)#int lo0
R3(config-if)#ip address 3.3.3.3 255.255.255.255
R3(config-if)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

Je tape la commande sh ip protocols

```
R1#sh ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 1.1.1.1
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.1.0 0.0.0.255 area 0
    192.168.12.0 0.0.0.3 area 0
    192.168.13.0 0.0.0.3 area 0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:00:10
    11.11.11.11          110      00:01:30
    22.22.22.22          110      00:00:10
    33.33.33.33          110      00:00:10
  Distance: (default is 110)

R1#
```

J’affiche les voisins de R1

```
R1#sh ip ospf neighbor


Neighbor ID     Pri   State           Dead Time   Address         Interface
3.3.3.3           0   INIT/  -        00:00:38    192.168.13.2    Serial0/0/1
2.2.2.2           0   FULL/  -        00:00:30    192.168.12.2    Serial0/0/0
R1#
```

Étape 2 : Modifiez l'ID de routeur sur R1 à l'aide de la commande router-i

Je change l'id du Routeur R1

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#router-id 11.11.11.11
R1(config-router)#Reload or use "clear ip ospf process" command, for this to take effect
```

R2 :

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#router-id 2
00:04:01: %OSPF-5-ADJCHG: Process 1, Nbr 11.11.11.11 on Serial0/0/0 from LOADING to FULL,
Loading Done

R2(config-router)#router-id 22.22.22.22
R2(config-router)#Reload or use "clear ip ospf process" command, for this to take effect
```

R3 :

```
R3(config)#router ospf 1
R3(config-router)#router-id
00:04:23: %OSPF-5-ADJCHG: Process 1, Nbr 22.22.22.22 on Serial0/0/1 from LOADING to FULL,
Loading Done

R3(config-router)#router-id 33.33.33.33
R3(config-router)#Reload or use "clear ip ospf process" command, for this to take effect
```

Je tape la commande sh ip protocols pour vérifier que l'id a bien été modifié

```
R1#sh ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 11.11.11.11
  Number of areas in this router is 1. 1 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.1.0 0.0.0.255 area 0
    192.168.12.0 0.0.0.3 area 0
    192.168.13.0 0.0.0.3 area 0
  Passive Interface(s):
    GigabitEthernet0/0
  Routing Information Sources:
    Gateway         Distance      Last Update
    1.1.1.1              110      00:05:12
    2.2.2.2              110      00:02:01
    3.3.3.3              110      00:01:09
    11.11.11.11          110      00:00:36
    22.22.22.22          110      00:00:36
    33.33.33.33          110      00:00:36
  Distance: (default is 110)
 --More--
```

Je vérifie également ceux des routeurs R2 et R3

```
R1#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
33.33.33.33       0   FULL/  -        00:00:32    192.168.13.2    Serial0/0/1
22.22.22.22       0   FULL/  -        00:00:31    192.168.12.2    Serial0/0/0
R1#
```

Partie 4 : Configuration des interfaces passives OSPF

Étape 1 : Configurez une interface passive

Apres avoir exécuter la command epassive-interface g0/0 je vérifie que il n'y a plus de message Hello

```
R1#sh ip ospf int g0/0

GigabitEthernet0/0 is up, line protocol is up
  Internet address is 192.168.1.1/24, Area 0
  Process ID 1, Router ID 11.11.11.11, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 11.11.11.11, Interface address 192.168.1.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    No Hellos (Passive interface)
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
R1#
```

Je vérifie qu'une route vers le réseau 192.168.1.0 existe toujours sur R2 et R3

R2 :

```
R2#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

     2.0.0.0/32 is subnetted, 1 subnets
C       2.2.2.2/32 is directly connected, Loopback0
O    192.168.1.0/24 [110/65] via 192.168.12.1, 00:06:18, Serial0/0/0
     192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.2.0/24 is directly connected, GigabitEthernet0/0
L       192.168.2.1/32 is directly connected, GigabitEthernet0/0
O    192.168.3.0/24 [110/65] via 192.168.23.2, 00:05:45, Serial0/0/1
     192.168.12.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.12.0/30 is directly connected, Serial0/0/0
L       192.168.12.2/32 is directly connected, Serial0/0/0
     192.168.13.0/30 is subnetted, 1 subnets
O       192.168.13.0/30 [110/128] via 192.168.12.1, 00:05:45, Serial0/0/0
 --More-- |
```

R3 :

```
R3#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

     3.0.0.0/32 is subnetted, 1 subnets
C       3.3.3.3/32 is directly connected, Loopback0
O    192.168.1.0/24 [110/65] via 192.168.13.1, 00:07:32, Serial0/0/0
O    192.168.2.0/24 [110/65] via 192.168.23.1, 00:07:32, Serial0/0/1
     192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.3.0/24 is directly connected, GigabitEthernet0/0
L       192.168.3.1/32 is directly connected, GigabitEthernet0/0
     192.168.12.0/30 is subnetted, 1 subnets
O       192.168.12.0/30 [110/128] via 192.168.13.1, 00:07:32, Serial0/0/0
                        [110/128] via 192.168.23.1, 00:07:32, Serial0/0/1
     192.168.13.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.13.0/30 is directly connected, Serial0/0/0
```

Étape 2 : Définissez l'interface passive comme interface par défaut sur un routeur

J’exécture la commande **show ip ospf neighbor** sur R1 pour vérifier que R2 est répertorié en tant que voisin OSPF

```
R1#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
33.33.33.33       0   FULL/  -        00:00:30    192.168.13.2    Serial0/0/1
22.22.22.22       0   FULL/  -        00:00:30    192.168.12.2    Serial0/0/0
R1#
```

J’exécute la commande **passive-interface default** sur R2 pour définir toutes les interfaces OSPF comme étant passives par défaut.

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#passive-interface default
R2(config-router)#
00:21:01: %OSPF-5-ADJCHG: Process 1, Nbr 33.33.33.33 on Serial0/0/1 from FULL to DOWN,
Neighbor Down: Interface down or detached

R2(config-router)#
```

J’exécute la commande sh ip neighbor sur R1

```
R1#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
33.33.33.33       0   FULL/  -        00:00:36    192.168.13.2    Serial0/0/1
R1#
```

Je tape la commande **show ip ospf interface S0/0/0** sur R2 pour afficher le statut OSPF de l'interface S0/0/0

```
R2#sh ip ospf int s0/0/0

Serial0/0/0 is up, line protocol is up
  Internet address is 192.168.12.2/30, Area 0
  Process ID 1, Router ID 22.22.22.22, Network Type POINT-TO-POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT-TO-POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    No Hellos (Passive interface)
  Index 2/2, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Suppress hello for 0 neighbor(s)
R2#
```

Sur R2 je tape la commande no passive-interface s0/0/0 pour que le routeur puisse re communiquer avec R1 et R3

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#no passive-interface default
R2(config-router)#
00:28:14: %OSPF-5-ADJCHG: Process 1, Nbr 33.33.33.33 on Serial0/0/1 from LOADING to FULL,
Loading Done

R2(config-router)#
```

J’exécute à nouveau les commandes **show ip route** et **show ip ospf neighbor** sur R1 et R3, et cherchez une route vers le réseau 192.168.2.0

R1 :

```
R1#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
33.33.33.33       0   FULL/  -        00:00:33    192.168.13.2    Serial0/0/1
22.22.22.22       0   FULL/  -        00:00:33    192.168.12.2    Serial0/0/0
R1#
```

```
R1#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

     1.0.0.0/32 is subnetted, 1 subnets
C       1.1.1.1/32 is directly connected, Loopback0
     192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/24 is directly connected, GigabitEthernet0/0
L       192.168.1.1/32 is directly connected, GigabitEthernet0/0
O    192.168.2.0/24 [110/65] via 192.168.12.2, 00:03:44, Serial0/0/0
O    192.168.3.0/24 [110/65] via 192.168.13.2, 00:09:39, Serial0/0/1
     192.168.12.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.12.0/30 is directly connected, Serial0/0/0
L       192.168.12.1/32 is directly connected, Serial0/0/0
     192.168.13.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.13.0/30 is directly connected, Serial0/0/1
 --More--
```

R3 :

```
R3#sh ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
11.11.11.11       0   FULL/  -        00:00:34    192.168.13.1    Serial0/0/0
22.22.22.22       0   FULL/  -        00:00:34    192.168.23.1    Serial0/0/1
R3#
```

```
R3#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

     3.0.0.0/32 is subnetted, 1 subnets
C       3.3.3.3/32 is directly connected, Loopback0
O    192.168.2.0/24 [110/65] via 192.168.23.1, 00:05:01, Serial0/0/1
     192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.3.0/24 is directly connected, GigabitEthernet0/0
L       192.168.3.1/32 is directly connected, GigabitEthernet0/0
     192.168.12.0/30 is subnetted, 1 subnets
O       192.168.12.0/30 [110/128] via 192.168.13.1, 00:05:01, Serial0/0/0
                        [110/128] via 192.168.23.1, 00:05:01, Serial0/0/1
     192.168.13.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.13.0/30 is directly connected, Serial0/0/0
 --More--
```

Partie 5 : Modification des métriques OSPF

Étape 1 : Modifiez la bande passante de référence sur les routeurs

J’exécute la commande **show interface** sur R1 pour afficher le paramètre de bande passante par défaut pour l'interface G0/0.

```
R1#sh int g0/0
GigabitEthernet0/0 is up, line protocol is up (connected)
  Hardware is CN Gigabit Ethernet, address is 00e0.a3b6.9801 (bia 00e0.a3b6.9801)
  Internet address is 192.168.1.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
```

J’exécute la commande **show ip route ospf** sur R1 pour déterminer la route vers le réseau

```
R1#sh ip route ospf
O    192.168.2.0 [110/65] via 192.168.12.2, 00:09:27, Serial0/0/0
O    192.168.3.0 [110/65] via 192.168.13.2, 00:15:22, Serial0/0/1
     192.168.23.0/30 is subnetted, 1 subnets
O       192.168.23.0 [110/128] via 192.168.12.2, 00:09:27, Serial0/0/0
                     [110/128] via 192.168.13.2, 00:09:27, Serial0/0/1

R1#
```

J’exécute la commande **show ip ospf interface** sur R3 pour savoir le coût du routage pour G0/0

```
R3#sh ip ospf int g0/0

GigabitEthernet0/0 is up, line protocol is up
  Internet address is 192.168.3.1/24, Area 0
  Process ID 1, Router ID 33.33.33.33, Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 33.33.33.33, Interface address 192.168.3.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:08
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
R3#
```

Je tape la commande **show ip ospf interface** sur R3 pour déterminer le coût du routage pour G0/0

```
R1#sh ip ospf int s0/0/1

Serial0/0/1 is up, line protocol is up
  Internet address is 192.168.13.1/30, Area 0
  Process ID 1, Router ID 11.11.11.11, Network Type POINT-TO-POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT-TO-POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:03
  Index 3/3, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 33.33.33.33
  Suppress hello for 0 neighbor(s)
R1#
```

Je modifie le paramètre de la bande passante sur R1

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#auto-cost reference-bandwidth 10000
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across all routers.
R1(config-router)#
```

Je fais la même chose sur R2 :

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 1
R2(config-router)#auto-cost reference-bandwidth 10000
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across all routers.
```

R3 :

```
R3(config-router)#auto-cost reference-bandwidth 10000
% OSPF: Reference bandwidth is changed.
        Please ensure reference bandwidth is consistent across all routers.
R3(config-router)#
```

J'exécute à nouveau la commande **show ip ospf interface** pour afficher le nouveau coût de G0/0 sur R3 et de S0/0/1 sur R1

```
R1#sh ip ospf int

GigabitEthernet0/0 is up, line protocol is up
  Internet address is 192.168.1.1/24, Area 0
  Process ID 1, Router ID 11.11.11.11, Network Type BROADCAST, Cost: 100
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 11.11.11.11, Interface address 192.168.1.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:01
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
Serial0/0/1 is up, line protocol is up
  Internet address is 192.168.13.1/30, Area 0
  Process ID 1, Router ID 11.11.11.11, Network Type POINT-TO-POINT, Cost: 6476
  Transmit Delay is 1 sec, State POINT-TO-POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:09
  Index 2/2, flood queue length 0
```

```
R3#sh ip ospf interface g0/0

GigabitEthernet0/0 is up, line protocol is up
  Internet address is 192.168.3.1/24, Area 0
  Process ID 1, Router ID 33.33.33.33, Network Type BROADCAST, Cost: 10
  Transmit Delay is 1 sec, State DR, Priority 1
  Designated Router (ID) 33.33.33.33, Interface address 192.168.3.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:03
  Index 1/1, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 0, Adjacent neighbor count is 0
  Suppress hello for 0 neighbor(s)
R3#
```

Je tape la commande sh ip interface s0/0/1

```
R1#sh ip ospf interface s0/0/1

Serial0/0/1 is up, line protocol is up
  Internet address is 192.168.13.1/30, Area 0
  Process ID 1, Router ID 11.11.11.11, Network Type POINT-TO-POINT, Cost: 6476
  Transmit Delay is 1 sec, State POINT-TO-POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:08
  Index 2/2, flood queue length 0
  Next 0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1 , Adjacent neighbor count is 1
    Adjacent with neighbor 33.33.33.33
  Suppress hello for 0 neighbor(s)
R1#
```

Étape 2 : Modifiez la bande passante d'une interface

J’exéute la commande sh interface s0/0/0

```
R1#sh interface s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
  Hardware is HD64570
  Internet address is 192.168.12.1/30
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
```

J’exécute la commande sh ip route ospf sur R1

```
R1#sh ip route ospf
O    192.168.2.0 [110/6576] via 192.168.12.2, 00:12:20, Serial0/0/0
     192.168.23.0/30 is subnetted, 1 subnets
```

J’exécute à nouveau la commande **show ip route ospf**

```
R1#sh ip route ospf
O    192.168.2.0 [110/6576] via 192.168.12.2, 00:13:48, Serial0/0/0
     192.168.23.0/30 is subnetted, 1 subnets
O       192.168.23.0 [110/12952] via 192.168.12.2, 00:13:48, Serial0/0/0

R1#
```

Je modifie la bande passante de l’interface s0/0/1 sur R1

```
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#int s0/0/1
R1(config-if)#bandwidth 128
```

J’exécute à nouveau la commande **show ip route ospf**

```
R1#sh ip route ospf
O    192.168.2.0 [110/6576] via 192.168.12.2, 00:04:57, Serial0/0/0
     192.168.23.0/30 is subnetted, 1 subnets
```

Étape 3 : Modifiez le coût de la route

```
R1#sh ip route ospf
O    192.168.2.0 [110/782] via 192.168.12.2, 00:08:43, Serial0/0/0
O    192.168.3.0 [110/782] via 192.168.13.2, 00:08:43, Serial0/0/1
     192.168.23.0/30 is subnetted, 1 subnets
O       192.168.23.0 [110/1562] via 192.168.12.2, 00:01:18, Serial0/0/0
                     [110/1562] via 192.168.13.2, 00:01:18, Serial0/0/1
```

```
R1#sh ip route ospf
O    192.168.2.0 [110/782] via 192.168.12.2, 00:12:32, Serial0/0/0
O    192.168.3.0 [110/1563] via 192.168.12.2, 00:00:50, Serial0/0/0
     192.168.23.0/30 is subnetted, 1 subnets
O       192.168.23.0 [110/1562] via 192.168.12.2, 00:00:50, Serial0/0/0
```