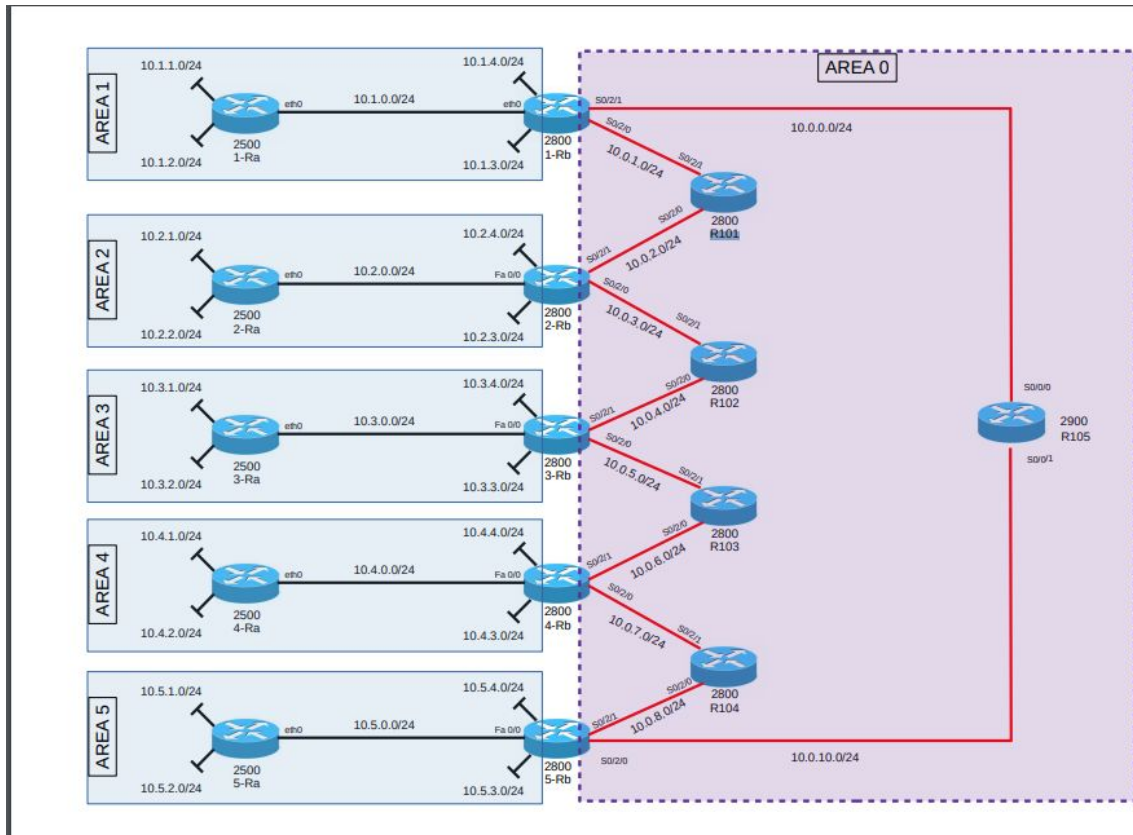


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TP Routage

TOPOLOGIE DU RESEAU:



La partie qui nous devons configurer était l'area 2 et le routeur 2800 R101 pour ce TP

Partie 1 :

Afin de configurer les routeur il faut taper les commandes suivantes :

→ POUR LE ROUTEUR 2-RA

```
enable
sh run
config t
interface g0/0
ip address 10.2.0.1 255.255.255.0
no shutdown
interface loopback0
ip address 10.2.1.1 255.255.255.0
no shutdown
interface loopback1
ip address 10.2.2.1 255.255.255.0
no shutdown
exit
hostname 2-Ra
exit
```

```
2-Ra#show ip int brief
Interface      IP-Address      OK? Method Status      Protocol
Ethernet0      10.2.0.1        YES manual  up          up
Ethernet1      unassigned      YES unset   administratively down down
Loopback0      10.2.1.1        YES manual  up          up
Loopback1      10.2.2.1        YES manual  up          up
Serial0        unassigned      YES unset   administratively down down
Serial1        unassigned      YES unset   administratively down down
```

Et pour la partie OSPF :

```
config t
router ospf 1
network 10.2.0.0 0.0.0.255 area 2
network 10.2.1.0 0.0.0.255 area 2
network 10.2.2.0 0.0.0.255 area 2
exit
exit
```

→ POUR LE ROUTEUR 2-RB

```
enable
sh run
config t
interface g0/1
ip address 10.2.0.1 255.255.255.0
no shutdown
interface s0/0/0
ip address 10.0.3.1 255.255.255.0
no shutdown
interface g0/0
ip address 10.2.0.2 255.255.255.0
no shutdown
interface loopback0
ip address 10.2.4.1 255.255.255.0
no shutdown
interface loopback1
ip address 10.2.3.1 255.255.255.0
no shutdown
exit
hostname 2-Rb
exit
```

```
2-Rb#show ip int brief
Interface                               IP-Address      OK? Method Status        Protocol
Embedded-Service-Engine0/0             unassigned      YES unset    administratively down down
GigabitEthernet0/0                      10.2.0.2        YES manual    up            up
GigabitEthernet0/1                      10.0.2.1        YES manual    up            up
Serial0/0/0                             10.0.3.1        YES manual    up            up
Serial0/0/1                             unassigned      YES unset    administratively down down
Loopback0                               10.2.4.1        YES manual    up            up
Loopback1                               10.2.3.1        YES manual    up            up
```

Et pour la partie OSPF:

```
config t
router ospf 1
network 10.2.0.0 0.0.0.255 area 2
network 10.2.4.0 0.0.0.255 area 2
network 10.2.3.0 0.0.0.255 area 2
network 10.0.2.0 0.0.0.255 area 0
network 10.0.3.0 0.0.0.255 area 0
exit
exit
```

→ POUR LE ROUTEUR R101

```
enable
sh run
config t
interface g0/1
ip address 10.0.1.2 255.255.255.0
no shutdown
interface g0/0
ip address 10.0.2.2 255.255.255.0
no shutdown
exit
hostname R101
exit
```

```
R101#show ip int brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
Ethernet0	10.0.2.2	YES	manual	up	up
Ethernet1	10.0.1.2	YES	manual	up	up
Serial0	unassigned	YES	unset	administratively down	down
Serial1	unassigned	YES	unset	administratively down	down

Et pour la partie OSPF:

```
config t
router ospf 1
network 10.0.2.0 0.0.0.255 area 0
network 10.0.1.0 0.0.0.255 area 0
exit
exit
```

Afin de vérifier le bon fonctionnement des routeurs de notre réseau, nous avons effectué un ping de R101 à une loopback de 2-Ra:

```
R101#ping 10.2.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.2.1.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/5/8 ms
```

Ce qui montre que le protocole OSPF fonctionne au sein de nos routeurs, mais on peut élargir cela à toute la classe avec la base de donnée OSPF présente sur le routeur :

```
R101#sh ip ospf database

        OSPF Router with ID (10.0.2.2) (Process ID 1)

        Router Link States (Area 0)

Link ID      ADV Router    Age      Seq#         Checksum Link count
10.0.2.2     10.0.2.2      1532     0x80000007  0x209A   2
10.0.4.2     10.0.4.2      399      0x8000000A  0xB16E   3
10.0.8.2     10.0.8.2      433      0x80000002  0x2848   3
10.0.10.2    10.0.10.2     259      0x80000002  0x1520   4
10.0.100.2   10.0.100.2    1940     0x80000004  0xF169   3
10.1.4.1     10.1.4.1      1488     0x80000007  0x1B06   3
10.2.4.1     10.2.4.1      505      0x80000005  0x819D   3
10.3.4.2     10.3.4.2      360      0x80000003  0x4E6D   3
10.4.0.2     10.4.0.2      433      0x80000009  0xD33E   3
10.5.4.1     10.5.4.1      258      0x80000003  0x89DA   3

        Net Link States (Area 0)

Link ID      ADV Router    Age      Seq#         Checksum
10.0.1.1     10.1.4.1      1533     0x80000001  0xA45B
10.0.2.1     10.2.4.1      1526     0x80000002  0x9764
10.0.4.1     10.0.4.2      1148     0x80000002  0xC333
10.0.6.1     10.4.0.2      1956     0x80000001  0x6830
10.0.8.1     10.5.4.1      449      0x80000001  0xA545

        Summary Net Link States (Area 0)

Link ID      ADV Router    Age      Seq#         Checksum
10.1.0.0     10.1.4.1      1698     0x80000002  0xD83E
10.1.1.1     10.1.4.1      1689     0x80000001  0xCF45
10.1.2.1     10.1.4.1      1689     0x80000001  0xC44F
10.2.0.0     10.2.4.1      1540     0x80000002  0xC450
10.2.1.1     10.2.4.1      1540     0x80000002  0xB958
10.2.2.1     10.2.4.1      1540     0x80000002  0xAE62
10.2.3.1     10.2.4.1      1540     0x80000002  0x3FDA
10.2.4.1     10.2.4.1      1540     0x80000002  0x34E4
10.3.0.0     10.3.4.2      1119     0x80000003  0xA868
10.3.1.1     10.3.4.2      1119     0x80000003  0x9D70
10.3.2.1     10.3.4.2      1119     0x80000003  0x927A
10.4.0.0     10.4.0.2      1653     0x80000001  0xB460
10.4.1.1     10.4.0.2      922      0x80000001  0xA968
10.4.2.1     10.4.0.2      933      0x80000001  0x9E72
10.4.3.1     10.4.0.2      815      0x80000001  0x2FEA
10.4.4.1     10.4.0.2      815      0x80000001  0x24F4
10.5.0.0     10.5.4.1      620      0x80000001  0x8A85
10.5.1.1     10.5.4.1      625      0x80000001  0x7F8D
10.5.2.1     10.5.4.1      625      0x80000001  0x7497
10.5.3.1     10.5.4.1      625      0x80000001  0x510
10.5.4.1     10.5.4.1      620      0x80000002  0xF71B
```

ANCIEN RAPPORT (avant les vacances)

Partie 1 : Afin de configurer les routeur il faut taper les commandes suivantes :

```
enable
conf t
hostame Ra2
int ga0/0 ip 10.2.0.2 255.255.255.0
no shutdown
exit
```

par exemple afin de configurer Ra2, dont le résultats des configurations est :

```
interface Loopback0
 ip address 10.2.4.1 255.255.255.0
!
interface Loopback1
 ip address 10.2.3.1 255.255.255.0
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 ip address 10.2.0.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 10.0.3.1 255.255.255.0
 clock rate 2000000
!
interface Serial0/0/1
 no ip address
 shutdown
 clock rate 2000000
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
```

et donc le tableau des interfaces est :

```
Rb2#sh ip int br
```

Interface	IP-Address	OK?	Method	Status	Protocol
Embedded-Service-Engine0/0	unassigned	YES	unset	administratively down	down
GigabitEthernet0/0	10.2.0.2	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/0/0	10.0.3.1	YES	manual	down	down
Serial0/0/1	unassigned	YES	unset	administratively down	down
Loopback0	10.2.4.1	YES	manual	up	up
Loopback1	10.2.3.1	YES	manual	up	up

De la même manière afin de créer les différentes Loopback sur Ra2

```

Ra2>enable
Ra2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Ra2(config)#inter
Ra2(config)#interface loo
Ra2(config)#interface loopback 0
Ra2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up
Ra2(config-if)#ip addre
Ra2(config-if)#ip address 10.2.1.1 255.255.255.0
Ra2(config-if)#no shut
Ra2(config-if)#no shutdown
Ra2(config-if)#exit
Ra2(config)#interface loopback 1
Ra2(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state t
Ra2(config-if)#ip address 10.2.2.1 255.255.255.0
Ra2(config-if)#no shutdown
Ra2(config-if)#exit
Ra2(config)#exit
Ra2#
%SYS-5-CONFIG_I: Configured from console by console
Ra2#copy run start
Building configuration...
[OK]
Ra2#

```

Nous avons effectué de la même manière ces commandes pour Rb2 pour déclarer ses adresses de Loopback

Ce qui nous permet finalement de Ra2 de ping Rb2

```

Ra2#ping 10.2.0.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.2.0.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/4 ms

```


Partie 2 OSPF :

Afin de configurer le routage OSPF sur Ra2 nous avons fait :

```
Ra2(config-router)#network 10.2.0.0 0.0.0.255 area ?
<0-4294967295>  OSPF area ID as a decimal value
A.B.C.D         OSPF area ID in IP address format

Ra2(config-router)#network 10.2.0.0 0.0.0.255 area 2
Ra2(config-router)#network 10.2.1.0 0.0.0.255 area 2
Ra2(config-router)#network 10.2.2.0 0.0.0.255 area 2
Ra2(config-router)#exit
Ra2(config)#exit
```

Et pour Rb2 nous avons :

```
Rb2#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Rb2(config)#router ospf ?
<1-65535>  Process ID

Rb2(config)#router ospf 1
Rb2(config-router)#net
Rb2(config-router)#network 10.2.0.0 0.0.0.255 area 2
Rb2(config-router)#network 10.2.0.0 0.0.0.255 area 2
*Dec 14 13:48:11.723: %OSPF-5-ADJCHG: Process 1, Nbr 10.2.2.1 on GigabitEthernet0/0 from
m LOADING to FULLrouter ospf 1
Rb2(config-router)#network 10.2.3.0 0.0.0.255 area 2
Rb2(config-router)#network 10.2.4.0 0.0.0.255 area 2
Rb2(config-router)#exit
Rb2(config)#exit
Rb2#sh i
*Dec 14 13:48:39.387: %SYS-5-CONFIG_I: Configured from console by consolep ospf data

      OSPF Router with ID (10.2.4.1) (Process ID 1)

      Router Link States (Area 2)

Link ID        ADV Router    Age         Seq#           Checksum Link count
10.2.2.1       10.2.2.1      35         0x80000004    0x004768 3
10.2.4.1       10.2.4.1      15         0x80000004    0x009115 3

      Net Link States (Area 2)

Link ID        ADV Router    Age         Seq#           Checksum
10.2.0.1       10.2.2.1      35         0x80000001    0x00B746
Rb2#
```

```
Rb2#sh ip ospf neighbor

Neighbor ID    Pri   State           Dead Time   Address        Interface
10.2.2.1       1     FULL/DR         00:00:33   10.2.0.1       GigabitEthernet0/0
Rb2#
```

IP route


```
Rb2#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
       i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override
```

Gateway of last resort is not set

```

      10.0.0.0/8 is variably subnetted, 8 subnets, 2 masks
C       10.2.0.0/24 is directly connected, GigabitEthernet0/0
L       10.2.0.2/32 is directly connected, GigabitEthernet0/0
O       10.2.1.1/32 [110/11] via 10.2.0.1, 00:01:49, GigabitEthernet0/0
O       10.2.2.1/32 [110/11] via 10.2.0.1, 00:01:49, GigabitEthernet0/0
C       10.2.3.0/24 is directly connected, Loopback1
L       10.2.3.1/32 is directly connected, Loopback1
C       10.2.4.0/24 is directly connected, Loopback0
L       10.2.4.1/32 is directly connected, Loopback0
Rb2#
```

```
Rb2#sh ip ospf neig
*Dec 14 14:30:30.215: %SYS-5-CONFIG_I: Configured from console by console

Neighbor ID      Pri   State             Dead Time   Address        Interface
10.0.50.1         0    FULL/ -          00:00:39    10.0.2.1       Serial0/0/1
10.2.2.1          1    FULL/BDR         00:00:39    10.2.0.1       GigabitEthernet0/0
Rb2#sh ip ospf data

      OSPF Router with ID (10.2.4.1) (Process ID 1)

        Router Link States (Area 2)

Link ID          ADV Router      Age             Seq#            Checksum Link count
10.0.4.1          10.0.4.1        1338            0x80000003     0x004F07 2
10.0.50.1         10.0.50.1        117             0x80000002     0x00C49A 2
10.2.2.1          10.2.2.1        236             0x80000009     0x005F4A 3
10.2.4.1          10.2.4.1        27              0x8000000A     0x005257 5

        Net Link States (Area 2)

Link ID          ADV Router      Age             Seq#            Checksum
10.2.0.2         10.2.4.1        235             0x80000001     0x009763

        Router Link States (Area 3)

Link ID          ADV Router      Age             Seq#            Checksum Link count
10.2.4.1         10.2.4.1        27              0x80000001     0x007152 1
Rb2#
```

Voici l'ip route ospf et la base de données de ospf du Routeur R101:

```
R101>enable
R101#sh ip ospf data
R101#sh ip ospf database

      OSPF Router with ID (10.0.50.1) (Process ID 1)

      Router Link States (Area 1)

Link ID        ADV Router    Age          Seq#          Checksum Link count
10.0.50.1      10.0.50.1    75           0x80000006   0x00AEAB 2
10.9.0.1       10.9.0.1     80           0x80000003   0x002005 2

      Router Link States (Area 2)

Link ID        ADV Router    Age          Seq#          Checksum Link count
10.0.4.1       10.0.4.1     314          0x80000008   0x00450C 2
10.0.50.1      10.0.50.1    105          0x8000000C   0x00B0A4 2
10.2.2.1       10.2.2.1     390          0x8000000B   0x005B4C 3
10.2.4.1       10.2.4.1     110          0x80000014   0x00BD19 7

      Net Link States (Area 2)

Link ID        ADV Router    Age          Seq#          Checksum
10.2.0.2       10.2.4.1     1348         0x80000002   0x009564

R101#sh ip route ospf
      10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O       10.2.1.1/32 [110/792] via 10.0.2.2, 00:01:52, Serial0/2/0
O       10.2.0.0/24 [110/791] via 10.0.2.2, 00:01:52, Serial0/2/0
O       10.0.3.0/24 [110/845] via 10.0.2.2, 00:01:52, Serial0/2/0
O       10.2.3.1/32 [110/782] via 10.0.2.2, 00:01:52, Serial0/2/0
O       10.2.2.1/32 [110/792] via 10.0.2.2, 00:01:52, Serial0/2/0
O       10.2.4.1/32 [110/782] via 10.0.2.2, 00:01:52, Serial0/2/0
R101#ping 10.0.1.2
```

Voici le IP Route pour le routeur R101 (modèle 2800)

```
R101#sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

      10.0.0.0/8 is variably subnetted, 9 subnets, 2 masks
O       10.2.1.1/32 [110/792] via 10.0.2.2, 00:07:03, Serial0/2/0
O       10.2.0.0/24 [110/791] via 10.0.2.2, 00:07:03, Serial0/2/0
C       10.0.0.0/24 is directly connected, Serial0/2/0
O       10.0.3.0/24 [110/845] via 10.0.2.2, 00:07:03, Serial0/2/0
O       10.2.3.1/32 [110/782] via 10.0.2.2, 00:07:03, Serial0/2/0
O       10.2.2.1/32 [110/792] via 10.0.2.2, 00:07:03, Serial0/2/0
C       10.0.1.0/24 is directly connected, Serial0/2/1
O       10.2.4.1/32 [110/782] via 10.0.2.2, 00:07:03, Serial0/2/0
C       10.0.50.0/24 is directly connected, Loopback0
R101#ping 10.0.0.2
```

Running Config : R101 (2800)

```
interface Loopback0
 ip address 10.0.50.1 255.255.255.0
!
interface FastEthernet0/0
 no ip address
 ip nat inside
 ip virtual-reassembly
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 ip nat outside
 ip virtual-reassembly
 duplex auto
 speed auto
!
interface Serial0/2/0
 ip address 10.0.2.1 255.255.255.0
!
interface Serial0/2/1
 ip address 10.0.1.1 255.255.255.0
 clock rate 125000
!
router ospf 1
 router-id 10.0.50.1
 log-adjacency-changes
 network 10.0.1.0 0.0.0.255 area 1
 network 10.0.2.0 0.0.0.255 area 2
!
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 192.168.100.254
!
!
```

de même pour Ra2 nous avons :

Running Config:

```
Ra2>
Ra2>enable
Ra2#sh run
Building configuration...

Current configuration:
!
version 11.2
no service udp-small-servers
no service tcp-small-servers
!
hostname Ra2
!
!
!
interface Loopback0
 ip address 10.2.1.1 255.255.255.0
!
interface Loopback1
 ip address 10.2.2.1 255.255.255.0
!
interface Ethernet0
 ip address 10.2.0.1 255.255.255.0
 no cdp enable
!
interface Serial0
 no ip address
 shutdown
 no cdp enable
!
interface Serial1
 no ip address
 shutdown
 no cdp enable
!
router ospf 1
 network 10.2.0.0 0.0.0.255 area 2
 network 10.2.1.0 0.0.0.255 area 2
 network 10.2.2.0 0.0.0.255 area 2
```

IP Route :

```
Ra2#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, * - candidate default
       U - per-user static route, o - ODR

Gateway of last resort is not set

    10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks
O       10.0.2.0/24 [110/74] via 10.2.0.2, 00:34:57, Ethernet0
C       10.2.0.0/24 is directly connected, Ethernet0
O       10.0.3.0/24 [110/74] via 10.2.0.2, 00:34:57, Ethernet0
C       10.2.1.0/24 is directly connected, Loopback0
O       10.2.3.1/32 [110/11] via 10.2.0.2, 00:34:57, Ethernet0
C       10.2.2.0/24 is directly connected, Loopback1
O       10.2.4.1/32 [110/11] via 10.2.0.2, 00:34:57, Ethernet0
```


Ospf (Ip route, database et neighbor) :

```
Ra2#sh ip route ospf
      10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks
O       10.0.2.0/24 [110/74] via 10.2.0.2, 00:36:40, Ethernet0
O       10.0.3.0/24 [110/74] via 10.2.0.2, 00:36:40, Ethernet0
O       10.2.3.1/32 [110/11] via 10.2.0.2, 00:36:40, Ethernet0
O       10.2.4.1/32 [110/11] via 10.2.0.2, 00:36:40, Ethernet0
Ra2#sh ip ospf database

      OSPF Router with ID (10.2.2.1) (Process ID 1)

      Router Link States (Area 2)

Link ID      ADV Router    Age      Seq#          Checksum Link count
10.0.4.1     10.0.4.1      554      0x80000009   0x430D   2
10.0.50.1    10.0.50.1     221      0x8000000D   0xAEA5   2
10.2.2.1     10.2.2.1      703      0x8000000C   0x594D   3
10.2.4.1     10.2.4.1      213      0x80000015   0xBB1A   7

      Net Link States (Area 2)

Link ID      ADV Router    Age      Seq#          Checksum
10.2.0.2     10.2.4.1     1471     0x80000003   0x9365

Ra2#sh ip ospf neig

Neighbor ID    Pri   State           Dead Time   Address      Interface
10.2.4.1       1     FULL/DR         00:00:37   10.2.0.2     Ethernet0
Ra2#
```

de même pour Rb2 nous avons :

Running Config:

```
!
interface Loopback0
 ip address 10.2.4.1 255.255.255.0
!
interface Loopback1
 ip address 10.2.3.1 255.255.255.0
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 ip address 10.2.0.2 255.255.255.0
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 10.0.3.1 255.255.255.0
!
interface Serial0/0/1
 ip address 10.0.2.2 255.255.255.0
 clock rate 125000
!
router ospf 1
 network 10.0.2.0 0.0.0.255 area 2
 network 10.0.3.0 0.0.0.255 area 2
 network 10.2.0.0 0.0.0.255 area 2
 network 10.2.3.0 0.0.0.255 area 2
 network 10.2.4.0 0.0.0.255 area 2
!
```


IP route:

```
Rb2#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
       i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is not set

    10.0.0.0/8 is variably subnetted, 12 subnets, 2 masks
C       10.0.2.0/24 is directly connected, Serial0/0/1
L       10.0.2.2/32 is directly connected, Serial0/0/1
C       10.0.3.0/24 is directly connected, Serial0/0/0
L       10.0.3.1/32 is directly connected, Serial0/0/0
C       10.2.0.0/24 is directly connected, GigabitEthernet0/0
L       10.2.0.2/32 is directly connected, GigabitEthernet0/0
O       10.2.1.1/32 [110/11] via 10.2.0.1, 01:21:29, GigabitEthernet0/0
O       10.2.2.1/32 [110/11] via 10.2.0.1, 01:21:29, GigabitEthernet0/0
C       10.2.3.0/24 is directly connected, Loopback1
L       10.2.3.1/32 is directly connected, Loopback1
C       10.2.4.0/24 is directly connected, Loopback0
L       10.2.4.1/32 is directly connected, Loopback0
Rb2#
```

Ospf (Ip route, database et neighbor) :

```
10.0.0.0/8 is variably subnetted, 12 subnets, 2 masks
C    10.0.2.0/24 is directly connected, Serial0/0/1
L    10.0.2.2/32 is directly connected, Serial0/0/1
C    10.0.3.0/24 is directly connected, Serial0/0/0
L    10.0.3.1/32 is directly connected, Serial0/0/0
C    10.2.0.0/24 is directly connected, GigabitEthernet0/0
L    10.2.0.2/32 is directly connected, GigabitEthernet0/0
O    10.2.1.1/32 [110/11] via 10.2.0.1, 01:21:29, GigabitEthernet0/0
O    10.2.2.1/32 [110/11] via 10.2.0.1, 01:21:29, GigabitEthernet0/0
C    10.2.3.0/24 is directly connected, Loopback1
L    10.2.3.1/32 is directly connected, Loopback1
C    10.2.4.0/24 is directly connected, Loopback0
L    10.2.4.1/32 is directly connected, Loopback0
Rb2#sh ip route ospf
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
       i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP
       a - application route
       + - replicated route, % - next hop override

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 12 subnets, 2 masks
O    10.2.1.1/32 [110/11] via 10.2.0.1, 01:22:25, GigabitEthernet0/0
O    10.2.2.1/32 [110/11] via 10.2.0.1, 01:22:25, GigabitEthernet0/0
Rb2#sh ip ospf data

        OSPF Router with ID (10.2.4.1) (Process ID 1)

        Router Link States (Area 2)

Link ID      ADV Router   Age         Seq#         Checksum Link count
10.0.4.1     10.0.4.1     831         0x80000009  0x00430D 2
10.0.50.1    10.0.50.1    497         0x8000000D  0x00AEA5 2
10.2.2.1     10.2.2.1     981         0x8000000C  0x00594D 3
10.2.4.1     10.2.4.1     490         0x80000015  0x00BB1A 7

        Net Link States (Area 2)

Link ID      ADV Router   Age         Seq#         Checksum
10.2.0.2     10.2.4.1    1747        0x80000003  0x009365
Rb2#sh ip ospf neig

Neighbor ID  Pri   State           Dead Time   Address      Interface
10.0.4.1     0     FULL/ -         00:00:31   10.0.3.3     Serial0/0/0
10.0.50.1    0     FULL/ -         00:00:39   10.0.2.1     Serial0/0/1
10.2.2.1     1     FULL/BDR        00:00:30   10.2.0.1     GigabitEthernet0/0
```

En conclusion, nous arrivons à communiquer dans notre zone, ie du routeur R101 au routeur Ra2, et nous arrivons aussi à communiquer avec la zone 1 à partir du routeur R101 car il se trouve au milieu, et nous avons implémenté les 2 zones dans la configuration OSPF de base .

Mais nous n'avons pas pu communiquer correctement entre les zones à partir d'un routeur autre que le routeur R101. Cela est sûrement dû à un problème de protocole OSPF, sachant que les configurations ont été vérifiées plusieurs fois, et les messages n'arrivent pas à trouver un destinataire qui se trouve dans une zone différente.

Routeur 2 RB

```
enable
sh run
config t
interface g0/1
ip address 10.2.0.1 255.255.255.0
no shutdown
interface s0/0/0
ip address 10.0.3.1 255.255.255.0
no shutdown
interface g0/0
ip address 10.2.0.2 255.255.255.0
no shutdown
interface loopback0
ip address 10.2.4.1 255.255.255.0
no shutdown
interface loopback1
ip address 10.2.3.1 255.255.255.0
no shutdown
exit
hostname 2-Rb
exit
OSPF
config t
router ospf 1
network 10.2.0.0 0.0.0.255 area 2
network 10.2.4.0 0.0.0.255 area 2
network 10.2.3.0 0.0.0.255 area 2
network 10.0.2.0 0.0.0.255 area 0
network 10.0.3.0 0.0.0.255 area 0

exit
exit
interreseaux
```

Routeur 1 RB

```
enable
sh run
config t
interface g0/1
ip address 10.2.0.1 255.255.255.0
no shutdown
interface s0/0/0
ip address 10.0.3.1 255.255.255.0
```

```
no shutdown
interface g0/0
ip address 10.2.0.2 255.255.255.0
no shutdown
interface loopback0
ip address 10.2.4.1 255.255.255.0
no shutdown
interface loopback1
ip address 10.2.3.1 255.255.255.0
no shutdown
exit
hostname 2-Rb
exit
OSPF
config t
router ospf 1
network 10.2.0.0 0.0.0.255 area 2
network 10.2.4.0 0.0.0.255 area 2
network 10.2.3.0 0.0.0.255 area 2
network 10.0.2.0 0.0.0.255 area 0
network 10.0.3.0 0.0.0.255 area 0

exit
exit
interreseaux
```

```

R101#show ip int brief
Interface                IP-Address      OK? Method Status      Protocol
Ethernet0                10.0.2.2        YES manual up          up
Ethernet1                10.0.1.2        YES manual up          up
Serial0                  unassigned      YES unset   administratively down down
Serial1                  unassigned      YES unset   administratively down down
R101#
2-Ra>enable
2-Ra#show ip int brief
Interface                IP-Address      OK? Method Status      Protocol
Ethernet0                10.2.0.1        YES manual up          up
Ethernet1                unassigned      YES unset   administratively down down
Loopback0                10.2.1.1        YES manual up          up
Loopback1                10.2.2.1        YES manual up          up
Serial0                  unassigned      YES unset   administratively down down
Serial1                  unassigned      YES unset   administratively down down
2-Ra#
2-Rb>enable
2-Rb#show ip int brief
Interface                IP-Address      OK? Method Status      Protocol
Embedded-Service-Engine0/0 unassigned      YES unset   administratively down down
GigabitEthernet0/0       10.2.0.2        YES manual up          up
GigabitEthernet0/1       10.0.2.1        YES manual up          up
Serial0/0/0              10.0.3.1        YES manual up          up
Serial0/0/1              unassigned      YES unset   administratively down down
Loopback0                10.2.4.1        YES manual up          up
Loopback1                10.2.3.1        YES manual up          up

```

Ping routeur d'un bout à l'autre de notre réseau