

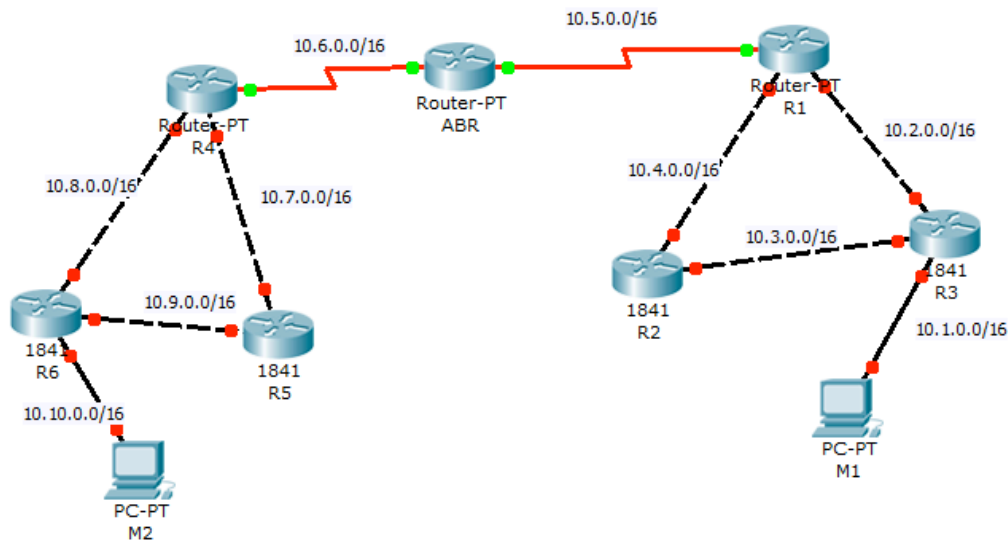
TP 6: Routage OSPF et RIPv2 (correction)

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Objectif :

Configuration des routages dynamiques **OSPF et RIPv2**.

Nous considérons la topologie suivante :



1. Configurer les machines M1 et M2.
2. Configurer les interfaces des routeurs.
3. Configurer les interfaces du routeur intermédiaire **ABR**
5. Configurer le routage OSPF les routeurs R4, R5 et R6.

R4(config)#router ospf 1

R4(config)#network 10.6.0.0 0.0.255.255 area 0

R4(config)#network 10.7.0.0 0.0.255.255 area 0

R4(config)#network 10.8.0.0 0.0.255.255 area 0

R5(config)#router ospf 1

R5(config)#network 10.9.0.0 0.0.255.255 area 0

R5(config)#network 10.7.0.0 0.0.255.255 area 0

R6(config)#router ospf 1

R6(config)#network 10.8.0.0 0.0.255.255 area 0

R6(config)#network 10.9.0.0 0.0.255.255 area 0

R6(config)#network 10.10.0.0 0.0.255.255 area 0

6. Configurer le routage RIPv2 sur les routeurs R1, R2 et R3.

```
R1(config)#router RIP
```

```
R1(config-router)#version 2
```

```
R1(config)#network 10.2.0.0
```

```
R1(config)#network 10.4.0.0
```

```
R1(config)#network 10.5.0.0
```

```
R2(config)#router RIP
```

```
R2(config-router)#version 2
```

```
R2(config)#network 10.3.0.0
```

```
R2(config)#network 10.4.0.0
```

```
R3(config)#router RIP
```

```
R3(config-router)#version 2
```

```
R3(config)#network 10.1.0.0
```

```
R3(config)#network 10.2.0.0
```

```
R3(config)#network 10.3.0.0
```

7. Pour relier les deux routeurs, configurer le routeur ABR avec OSPF et RIPv2.

```
ABR(config)#router ospf 1
```

```
ABR(config-router)#network 10.6.0.0 0.0.255.255 area 0
```

```
ABR(config-router)#network 10.5.0.0 0.0.255.255 area 0
```

```
ABR(config)#router rip
```

```
ABR(config-router)#version 2
```

```
ABR(config-router)#no auto-summary
```

```
ABR(config-router)#network 10.5.0.0
```

```
ABR(config-router)#network 10.6.0.0
```

```
ABR(config)#end
```

8. Tester la connectivité entre les machines.

```
M1>ping 10.10.0.2
```

```
Pinging 10.10.0.2 with 32 bytes of data: Reply from 10.1.0.1: Destination host unreachable. Reply from 10.1.0.1: Destination host unreachable. Reply from 10.1.0.1: Destination host unreachable. Reply from 10.1.0.1: Destination host unreachable. Ping statistics for 10.10.0.2: Packets: Sent = 4, Received = 0, Lost = 4 (100% loss), M1 et M2 ne sont pas connectés.
```

9. Afficher la table de routage des trois routeurs R1, ABR et R4.

```
ABR#show ip route
```

```
abr: 10.0.0.0/16 is subnetted, 10 subnets
```

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```

R 10.1.0.0 [120/2] via 10.5.0.2, 00:00:16, Serial2/0
R 10.2.0.0 [120/1] via 10.5.0.2, 00:00:16, Serial2/0
R 10.3.0.0 [120/2] via 10.5.0.2, 00:00:16, Serial2/0
R 10.4.0.0 [120/1] via 10.5.0.2, 00:00:16, Serial2/0
C 10.5.0.0 is directly connected, Serial2/0
C 10.6.0.0 is directly connected, Serial3/0
O 10.7.0.0 [110/65] via 10.6.0.2, 01:07:38, Serial3/0
O 10.8.0.0 [110/65] via 10.6.0.2, 01:07:38, Serial3/0
O 10.9.0.0 [110/66] via 10.6.0.2, 01:07:38, Serial3/0
O 10.10.0.0 [110/66] via 10.6.0.2, 01:01:23, Serial3/0

```

R1# show ip route

```

R1 : 10.0.0.0/16 is subnetted, 6 subnets
R 10.1.0.0 [120/1] via 10.2.0.2, 00:00:19, FastEthernet1/0
C 10.2.0.0 is directly connected, FastEthernet1/0
R 10.3.0.0 [120/1] via 10.4.0.2, 00:00:06, FastEthernet0/0 [120/1]
    via 10.2.0.2, 00:00:19, FastEthernet1/0
C 10.4.0.0 is directly connected, FastEthernet0/0
C 10.5.0.0 is directly connected, Serial2/0
R 10.6.0.0 [120/1] via 10.5.0.1, 00:00:03, Serial2/0

```

R4#show ip route

```

R4 : 10.0.0.0/16 is subnetted, 6 subnets
O 10.5.0.0 [110/128] via 10.6.0.1, 01:11:14, Serial2/0
C 10.6.0.0 is directly connected, Serial2/0 C 10.7.0.0 is directly connected, FastEthernet1/0
C 10.8.0.0 is directly connected, FastEthernet0/0
O 10.9.0.0 [110/2] via 10.7.0.2, 01:20:58, FastEthernet1/0 [110/2]
    via 10.8.0.2, 01:20:58, FastEthernet0/0
O 10.10.0.0 [110/2] via 10.8.0.2, 01:04:59, FastEthernet0/0

```

A. Première méthode pour relier les deux nuages OSPF et RIP

1. Ajouter une route statique sur le routeur **ABR**, puis propager-la sur les routeurs **OSPF**

```

ABR(config)# ip route 0.0.0.0 0.0.0.0 serial2/0
ABR (config)#router rip
ABR (config-router)#default-information originate
ABR (config-router)#redistribute static

```

2. Ajouter une route statique sur **OSPF**, puis propager la sur les routeurs **RIP**

```

ABR(config)#ip route 0.0.0.0 0.0.0.0 serial 1/0
ABR(config)#router ospf 1
ABR(config-router)#default-information originate
ABR(config-router)#redistribute static subnets
ABR#show ip route

```

```

10.0.0.0/16 is subnetted, 10 subnets R 10.1.0.0 [120/2] via 10.5.0.2, 00:00:07, Serial2/0 R 10.2.0.0 [120/1] via
10.5.0.2, 00:00:07, Serial2/0 R 10.3.0.0 [120/2] via 10.5.0.2, 00:00:07, Serial2/0 R 10.4.0.0 [120/1] via 10.5.0.2,
00:00:07, Serial2/0 C 10.5.0.0 is directly connected, Serial2/0 C 10.6.0.0 is directly connected, Serial3/0 O 10.7.0.0
[110/65] via 10.6.0.2, 01:20:40, Serial3/0 O 10.8.0.0 [110/65] via 10.6.0.2, 01:20:40, Serial3/0 O

```

10.9.0.0 [110/66] via 10.6.0.2, 01:20:40, Serial3/0 O 10.10.0.0 [110/66] via 10.6.0.2, 01:14:25, Serial3/0
S* 0.0.0.0/0 is directly connected, Serial2/0 is directly connected, Serial3/0

3. Tester la connectivité entre les machines.

M1>ping 10.10.0.2

Pinging 10.10.0.2 with 32 bytes of data: Reply from 10.10.0.2: bytes=32 time=27ms TTL=123 Reply from 10.10.0.2: bytes=32 time=18ms TTL=123 Reply from 10.10.0.2: bytes=32 time=19ms TTL=123 Reply from 10.10.0.2: bytes=32 time=16ms TTL=123 Ping statistics for 10.10.0.2: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 16ms, Maximum = 27ms, Average = 20ms

R1#show ip route

10.0.0.0/16 is subnetted, 6 subnets R 10.1.0.0 [120/1] via 10.2.0.2, 00:00:07, FastEthernet1/0 C 10.2.0.0 is directly connected, FastEthernet1/0 R 10.3.0.0 [120/1] via 10.4.0.2, 00:00:03, FastEthernet0/0 [120/1] via 10.2.0.2, 00:00:07, FastEthernet1/0 C 10.4.0.0 is directly connected, FastEthernet0/0 C 10.5.0.0 is directly connected, Serial2/0 R 10.6.0.0 [120/1] via 10.5.0.1, 00:00:01, Serial2/0
R* 0.0.0.0/0 [120/1] via 10.5.0.1, 00:00:01, Serial2/0

4. Afficher les routes traversées.

R3#traceroute 10.10.0.2

Tracing the route to 10.10.0.2
1 10.2.0.1 2 msec 0 msec 0 msec
2 10.5.0.1 4 msec 1 msec 5 msec
3 10.6.0.2 4 msec 4 msec 10 msec
4 10.8.0.2 16 msec 13 msec 11 msec
5 10.10.0.2 16 msec 16 msec 16 msec
Chemin du paquet :

R3 -> R1 (10.2.0.1 in), R1 (10.5.0.1 out)-> ABR, ABR (10.6.0.2 out) -> R4 (10.8.0.2)-> R6, R6 -> M2 (10.10.0.2).

5. Sauvegarder votre configuration sur le serveur TFTP de votre choix.

B. Deuxième méthode pour relier les deux nuages OSPF et RIP

1. Supprimer les routes statiques par défaut du routeur ABR

ABR(config)# no ip route 0.0.0.0 0.0.0.0 serial 2/0

ABR(config)#no ip route 0.0.0.0 0.0.0.0 serial 1/0

M2>ping M1?

2. Propager le nuage RIPv2 sur les routeurs OSPF pour compléter la table de routage ospf.

ABR(config)#router ospf 1

ABR (config-router)#redistribute rip

ABR (config-router)#redistribute rip subnets

3. Propager le nuage OSPF sur les routeurs RIP pour compléter la table de routage RIPv2.

ABR (config)#router rip

ABR (config-router)#redistribute ospf 1 metric 1 (justifier votre métrique)

4. Tester à nouveau la connectivité entre les machines.

M1>ping 10.10.0.2

Pinging 10.1.0.2 with 32 bytes of data: Reply from 10.1.0.2: bytes=32 time=24ms TTL=123 Reply from 10.1.0.2: bytes=32 time=11ms TTL=123 Reply from 10.1.0.2: bytes=32 time=13ms TTL=123 Reply from 10.1.0.2: bytes=32 time=15ms TTL=123 Ping statistics for 10.1.0.2: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = 11ms, Maximum = 24ms, Average = 15ms

5. Afficher la table de routages des routeurs R6 et R3.

R6 # show ip route

10.0.0.0/16 is subnetted, 10 subnets
O E2 10.1.0.0 [110/20] via 10.8.0.1, 00:03:55, FastEthernet0/0
O E2 10.2.0.0 [110/20] via 10.8.0.1, 00:03:55, FastEthernet0/0
O E2 10.3.0.0 [110/20] via 10.8.0.1, 00:03:55, FastEthernet0/0
O E2 10.4.0.0 [110/20] via 10.8.0.1, 00:03:55, FastEthernet0/0
Nuage RIP est envoyé aux routeurs OSPF
O 10.5.0.0 [110/129] via 10.8.0.1, 01:44:00, FastEthernet0/0
O 10.6.0.0 [110/65] via 10.8.0.1, 01:53:54, FastEthernet0/0
O 10.7.0.0 [110/2] via 10.8.0.1, 01:53:44, FastEthernet0/0
[110/2] via 10.9.0.1, 01:53:44, FastEthernet1/0
C 10.8.0.0 is directly connected, FastEthernet0/0
C 10.9.0.0 is directly connected, FastEthernet1/0
C 10.10.0.0 is directly connected, FastEthernet6/0
Pour quoi la métrique est égale 20, pour un réseau RIP externe.

R3#show ip route

10.0.0.0/16 is subnetted, 10 subnets
C 10.1.0.0 is directly connected, FastEthernet6/0
C 10.2.0.0 is directly connected, FastEthernet0/0
C 10.3.0.0 is directly connected, FastEthernet1/0
R 10.4.0.0 [120/1] via 10.2.0.1, 00:00:30, FastEthernet0/0 [120/1]
via 10.3.0.2, 00:00:02, FastEthernet1/0
R 10.5.0.0 [120/1] via 10.2.0.1, 00:00:30, FastEthernet0/0
R 10.6.0.0 [120/2] via 10.2.0.1, 00:00:30, FastEthernet0/0
R 10.7.0.0 [120/2] via 10.2.0.1, 00:00:30, FastEthernet0/0
R 10.8.0.0 [120/2] via 10.2.0.1, 00:00:30, FastEthernet0/0
R 10.9.0.0 [120/2] via 10.2.0.1, 00:00:30, FastEthernet0/0
R 10.10.0.0 [120/2] via 10.2.0.1, 00:00:30, FastEthernet0/0
Nuage OSPF est envoyé aux routeurs RIP.

Pourquoi la métrique égale 2, deux routeurs à traverser R1 et ABR.

6. Sauvegarder votre configuration sur le serveur TFTP de votre choix.

7. Ajoutez la route statique suivante sur le routeur R1 pour se connecter à l'Internet:

R1(config)# int loopback 0
R1(config-if)#ip address 130.0.0.1 255.255.255.255
R1(config)#ip route 0.0.0.0 0.0.0.0 loopback 0

8. Propager cette route vers les autres routeurs.

```
R1 (config)#router rip
```

```
R1 (config-router)#default-information originate
```

```
R1 (config-router)#redistribute static
```

9. Tester à nouveau la connectivité des machines à l'internet.

```
M1>ping 130.0.0.1
```

```
Pinging 130.0.0.1 with 32 bytes of data: Reply from 130.0.0.1: bytes=32 time=1ms TTL=254 Reply from 130.0.0.1: bytes=32 time<1ms TTL=254 Reply from 130.0.0.1: bytes=32 time<1ms TTL=254 Reply from 130.0.0.1: bytes=32 time<1ms TTL=254 Ping statistics for 130.0.0.1: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
M2>ping 130.0.0.1
```

```
Pinging 130.0.0.1 with 32 bytes of data: Reply from 130.0.0.1: bytes=32 time=23ms TTL=252 Reply from 130.0.0.1: bytes=32 time=15ms TTL=252 Reply from 130.0.0.1: bytes=32 time=11ms TTL=252 Reply from 130.0.0.1: bytes=32 time=15ms TTL=252 Ping statistics for 130.0.0.1: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

10. Afficher la table de routage du routeur R6.

```
R6#show ip route
```

```
O E2 10.1.0.0 [110/20] via 10.8.0.1, 00:22:10, FastEthernet0/0
O E2 10.2.0.0 [110/20] via 10.8.0.1, 00:22:10, FastEthernet0/0
O E2 10.3.0.0 [110/20] via 10.8.0.1, 00:22:10, FastEthernet0/0
O E2 10.4.0.0 [110/20] via 10.8.0.1, 00:22:10, FastEthernet0/0
O 10.5.0.0 [110/129] via 10.8.0.1, 02:02:15, FastEthernet0/0
O 10.6.0.0 [110/65] via 10.8.0.1, 02:12:09, FastEthernet0/0
O 10.7.0.0 [110/2] via 10.8.0.1, 02:11:59, FastEthernet0/0 [110/2]
    via 10.9.0.0 is directly connected, FastEthernet1/0
C 10.10.0.0 is directly connected, FastEthernet6/0
O*E2 0.0.0.0/0 [110/1] via 10.8.0.1, 00:01:01, FastEthernet0/0
```