TP2-Reseau

Adnane Mandili

Emmanuel Clement PREIRA **GL2**

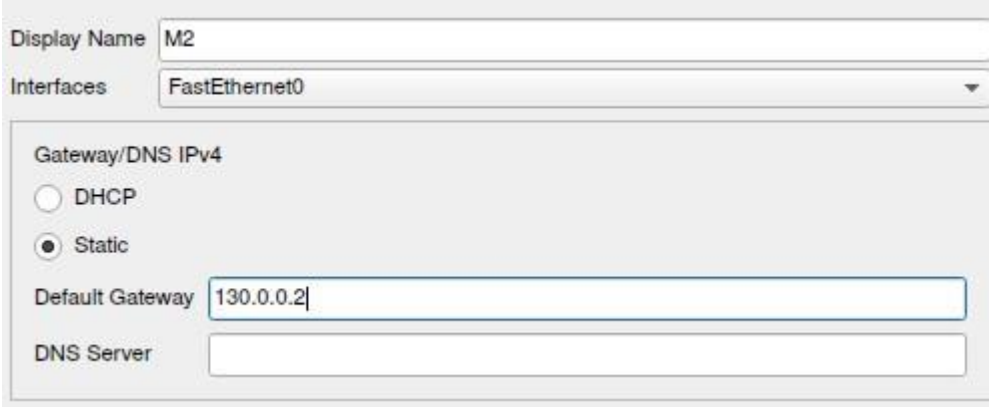
Ex1:

La configuration ip de machine M1:

La passerelle de M1:

La configuration ip de la machine M2:

La passerelle de M2:



Ex2:

Configuration routeur A:

On configure le login:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname A
A(config)#enable password class
A(config)#line console 0
A(config-line)#password cisco
A(config-line)#login
A(config-line)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#line vty 0 4
A(config-line)#password cisco
A(config-line)#login
A(config-line)#end
A#
%SYS-5-CONFIG_I: Configured from console by console
```

les interfaces disponibles:

```
A#show ip int br
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        130.0.2.1       YES manual administratively down down
FastEthernet1/0        unassigned      YES unset  administratively down down
Serial2/0              unassigned      YES unset  administratively down down
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
A#
```

la configuration ip de l'interface FastEthernet0/0:

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#interface FastEthernet0/0
A(config-if)#ip address 130.0.2.1 255.255.254.0
A(config-if)#no shutdown

A(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

A(config-if)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#
```

et de l'interface Serial2/0:

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#interface Serial2/0
A(config-if)#ip address 130.0.0.1 255.255.255.252
A(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
A(config-if)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#
```

Configuration Router B

et de meme comme le routeur A:

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname B
B(config)#line console 0
B(config-line)#password cisco
B(config-line)#login
B(config-line)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#line vty 0 4
B(config-line)#password cisco
B(config-line)#login
B(config-line)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#show ip int br
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        unassigned      YES unset  administratively down down
FastEthernet1/0        unassigned      YES unset  administratively down down
Serial2/0              unassigned      YES unset  administratively down down
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#interface FastEthernet0/0
B(config-if)#ip address 130.0.4.129 255.255.255.128
B(config-if)#no shutdown

B(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#interface Serial2/0
B(config-if)#ip address 130.0.0.2 255.255.255.252
B(config-if)#no shutdown

B(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

B(config-if)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
```

Configuration Routeur DCE

On configure le clock rate:

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#interface Serial2/0
A(config-if)#clock rate 64000
A(config-if)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#
```

Verification des interfaces de Routeur A

Les interfaces sont up:

```
A#show ip int br
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        130.0.2.1       YES manual up                    up
FastEthernet1/0        unassigned      YES unset  administratively down down
Serial2/0              130.0.0.1       YES manual up                    up
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
A#
```

Verification des interfaces de Routeur B

Les interfacse sont up:

```
B#show ip int br
Interface              IP-Address      OK? Method Status                Protocol
FastEthernet0/0        130.0.4.129     YES manual up                    up
FastEthernet1/0        unassigned      YES unset  administratively down down
Serial2/0              130.0.0.2       YES manual up                    up
Serial3/0              unassigned      YES unset  administratively down down
FastEthernet4/0        unassigned      YES unset  administratively down down
FastEthernet5/0        unassigned      YES unset  administratively down down
B#
```

Ex3:

Il est possible d'utiliser le nom de l'interface physique comme passerelle dans la commande `ip route` si on utilise un routeur cisco

Routage de B

on utilise la route par defaut:

```
B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#ip route 0.0.0.0 0.0.0.0 130.0.0.1
B(config)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#show 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 130.0.0.1 to network 0.0.0.0

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.4.128/25 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 [1/0] via 130.0.0.1

B#
```

Routage de A

on utilise la route par defaut:

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#ip route 0.0.0.0 0.0.0.0 130.0.0.2
A(config)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#show 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 130.0.0.2 to network 0.0.0.0

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.2.0/23 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 [1/0] via 130.0.0.2

A#
```

Test de ping

le ping de M1 vers M2 est ok:

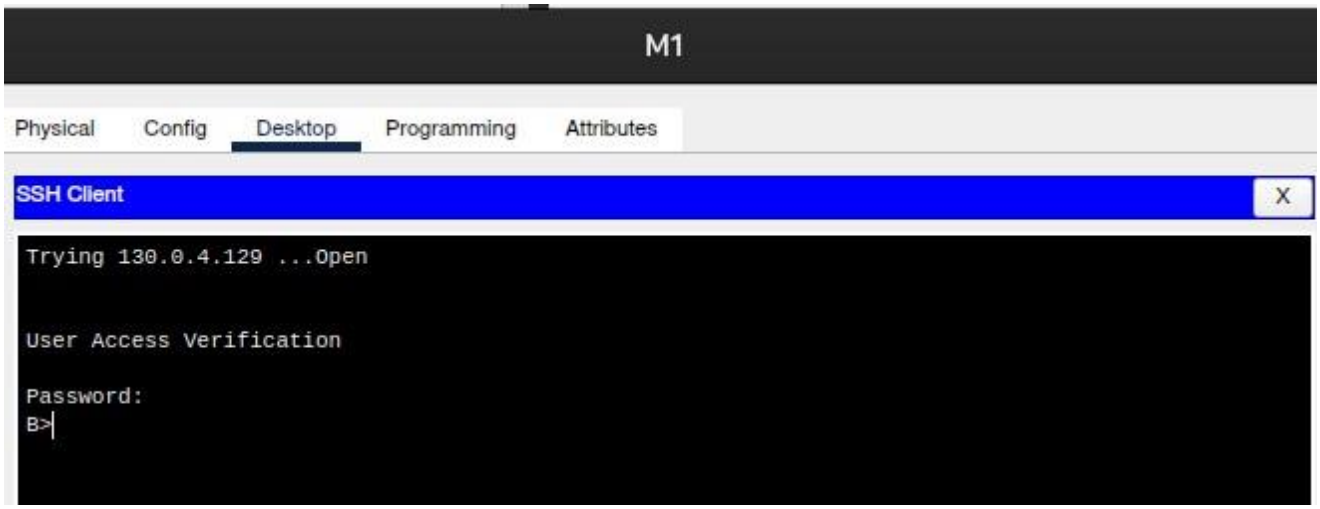
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 130.0.4.130

Pinging 130.0.4.130 with 32 bytes of data:

Request timed out.
Reply from 130.0.4.130: bytes=32 time=7ms TTL=126
Reply from 130.0.4.130: bytes=32 time=9ms TTL=126
Reply from 130.0.4.130: bytes=32 time=5ms TTL=126

Ping statistics for 130.0.4.130:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 5ms, Maximum = 9ms, Average = 7ms

C:\>
```

le ping de M2 vers M1 est ok:

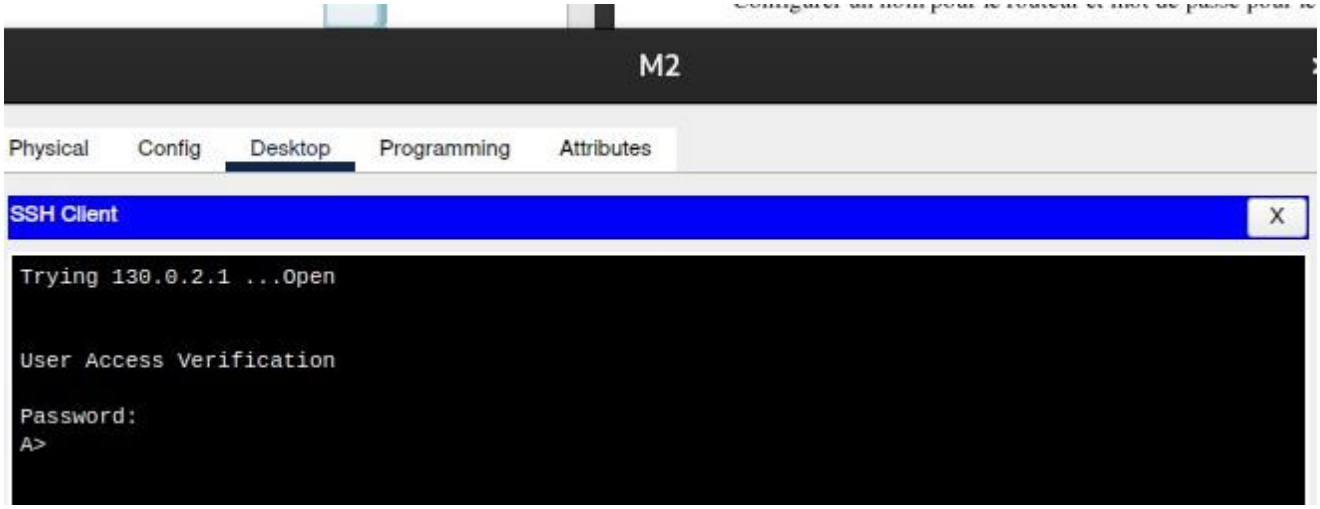
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 130.0.2.2

Pinging 130.0.2.2 with 32 bytes of data:

Reply from 130.0.2.2: bytes=32 time=14ms TTL=126
Reply from 130.0.2.2: bytes=32 time=16ms TTL=126
Reply from 130.0.2.2: bytes=32 time=8ms TTL=126
Reply from 130.0.2.2: bytes=32 time=14ms TTL=126

Ping statistics for 130.0.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 8ms, Maximum = 16ms, Average = 13ms

C:\>
```

Test telnet

De M1 vers Routeur B:



De M2 vers Routeur A:



Ex4 (RIP)

On supprime les routes par defaut (Routeur A)

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#no ip route 0.0.0.0 0.0.0.0 130.0.0.2
A(config)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#show 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

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.2.0/23 is directly connected, FastEthernet0/0

A#
```

On supprime les routes par defaut (Routeur B)

```
B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#no ip route 0.0.0.0 0.0.0.0 130.0.0.1
B(config)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#show 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

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.4.128/25 is directly connected, FastEthernet0/0

B#
```

On utilise le RIPv1 (Routeur A)

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#router rip
A(config-router)#network 130.0.0.0
A(config-router)#network 130.0.2.0
A(config-router)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 4 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
  Interface             Send  Recv  Triggered RIP  Key-chain
  FastEthernet0/0       12 1
  Serial2/0             12 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
            130.0.0.0
Passive Interface(s):
Routing Information Sources:
            Gateway         Distance      Last Update
Distance: (default is 120)
A#
```

On utilise le RIPv1 (Routeur B)

```
B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#router rip
B(config-router)#network 130.0.0.0
B(config-router)#network 130.0.4.128
B(config-router)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 8 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 1, receive any version
  Interface             Send  Recv  Triggered RIP  Key-chain
  FastEthernet0/0       12 1
  Serial2/0             12 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
           130.0.0.0
Passive Interface(s):
Routing Information Sources:
           Gateway         Distance      Last Update
Distance: (default is 120)
B#
```

Table de routage pour RIPv1

```
B#show 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

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.4.128/25 is directly connected, FastEthernet0/0

B#
```

L'echange des tables de routages n'a pas eu lieu car on utilise le RIPv1 qui ne prend pas en charge le VLSM Creation de loopback sur Routeur A

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#int loopback 0

A(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

A(config-if)#ip address 212.1.1.1 255.255.255.255
A(config-if)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#
```

255.255.255.255 signifie qu'on a une seul interface connectee et le IP reseau = IP machine = IP broadcast

Routage de loopback sur Routeur A

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#ip route 192.168.0.0 255.255.0.0 loopback 0
A(config)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#show 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

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.2.0/23 is directly connected, FastEthernet0/0
S    192.168.0.0/16 is directly connected, Loopback0
     212.1.1.0/32 is subnetted, 1 subnets
C       212.1.1.1 is directly connected, Loopback0

A#
```

Redistrubtion avec RIP

```
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#router rip
A(config-router)#redistribute static
A(config-router)#network 130.0.0.0
A(config-router)#network 130.0.2.0
A(config-router)#network 192.168.0.0
A(config-router)#network 212.1.1.0
A(config-router)#end
A#
%SYS-5-CONFIG_I: Configured from console by console

A#show ip protocols
Routing Protocol is "rip"
Sending updates every 30 seconds, next due in 21 seconds
Invalid after 180 seconds, hold down 180, flushed after 240
Outgoing update filter list for all interfaces is not set
Incoming update filter list for all interfaces is not set
Redistributing: rip, static
Default version control: send version 1, receive any version
  Interface             Send  Recv  Triggered RIP  Key-chain
  FastEthernet0/0       12 1
  Serial2/0             12 1
  Loopback0             12 1
Automatic network summarization is in effect
Maximum path: 4
Routing for Networks:
            130.0.0.0
            192.168.0.0
            212.1.1.0
Passive Interface(s):
Routing Information Sources:
            Gateway         Distance      Last Update
Distance: (default is 120)
A#
```

Resultat de l'echange de table de routage

```
B#
B#show 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

     130.0.0.0/16 is variably subnetted, 2 subnets, 2 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.4.128/25 is directly connected, FastEthernet0/0
R    212.1.1.0/24 [120/1] via 130.0.0.1, 00:00:09, Serial2/0

B#
```

Le RIPv1 n'echange pas la route de 192.168.0.0 car RIPv1 respecte les classes reseaux, 192.168.0.0 doit etre dans la classe C avec un mask 255.255.255.0 mais on a definit un mask 255.255.0.0

Configuration RIPv2 (Routeur A)

```
A#
A#configure termin
A#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
A(config)#router rip
A(config-router)#version 2
A(config-router)#end
A#
%SYS-5-CONFIG_I: Configured from console by console
```

Configuration RIPv2 (Routeur B)

```
B#
B#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
B(config)#router rip
B(config-router)#version 2
B(config-router)#end
B#
%SYS-5-CONFIG_I: Configured from console by console

B#
```

Resultats d'echange (Routeur A)

```
A#show 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

     130.0.0.0/16 is variably subnetted, 3 subnets, 3 masks
C       130.0.0.0/30 is directly connected, Serial2/0
C       130.0.2.0/23 is directly connected, FastEthernet0/0
R       130.0.4.128/25 [120/1] via 130.0.0.2, 00:00:00, Serial2/0
S    192.168.0.0/16 is directly connected, Loopback0
     212.1.1.0/32 is subnetted, 1 subnets
C       212.1.1.1 is directly connected, Loopback0

A#
```

Resultats d'echange (Routeur B)

```
B#show 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

     130.0.0.0/16 is variably subnetted, 3 subnets, 3 masks
C       130.0.0.0/30 is directly connected, Serial2/0
R       130.0.2.0/23 [120/1] via 130.0.0.1, 00:00:18, Serial2/0
C       130.0.4.128/25 is directly connected, FastEthernet0/0
R    192.168.0.0/16 [120/1] via 130.0.0.1, 00:00:18, Serial2/0
R    212.1.1.0/24 [120/1] via 130.0.0.1, 00:00:18, Serial2/0

B#
```

L'echange des routes est complet

Test de ping (M1 vers M2)

```
C:\>ping 130.0.4.130

Pinging 130.0.4.130 with 32 bytes of data:

Reply from 130.0.4.130: bytes=32 time=7ms TTL=126
Reply from 130.0.4.130: bytes=32 time=9ms TTL=126
Reply from 130.0.4.130: bytes=32 time=10ms TTL=126
Reply from 130.0.4.130: bytes=32 time=10ms TTL=126

Ping statistics for 130.0.4.130:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 7ms, Maximum = 10ms, Average = 9ms

C:\>
```

Test de ping (M2 vers M1)

```
C:\>ping 130.0.2.2

Pinging 130.0.2.2 with 32 bytes of data:

Reply from 130.0.2.2: bytes=32 time=7ms TTL=126
Reply from 130.0.2.2: bytes=32 time=10ms TTL=126
Reply from 130.0.2.2: bytes=32 time=8ms TTL=126
Reply from 130.0.2.2: bytes=32 time=6ms TTL=126

Ping statistics for 130.0.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 6ms, Maximum = 10ms, Average = 7ms

C:\>
```

On peut avoir (2^9 - 2) 510 machines dans le sous reseau 1

On peut avoir (2^7 - 2) 126 machines dans le sous reseau 2

On peut avoir (2^2 - 2) 2 machines dans le sous reseau 3

VLSM 130.0.0.0/16

Segment	Capacite	Addresse Reseau
Segment 1	9000	130.0.0.0/18
Segment 2	1000	130.0.64.0/22
Segment 3	400	130.0.68.0/23