

Devoir Maison TP Réseaux

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L'@IP réseau mère : 149.77.16.0/22

1. Convertissez 149.77.16.0/22 en binaire :

$128+16+4+1.64+8+4+1.16.0 = 10010101.01001101.00010000.00000000$

$149=2^7+2^4+2^2+2^0 = (10010101)_b$

$77=2^6+2^3+2^2+2^0 = (01001101)_b$

$16=2^4 = (00010000)_b$

$0=0 = (00000000)_b$

10010101.01001101.000100 00.00000000

Partie Réseaux

Partie Machine

2. Donnez pour 149.77.16.0/22 (tout en justifiant) :

/22 est le masque en décimal et qui veut dire que la Partie Réseaux est sur 22 bits donc :

Le masque en binaire : 11111111.11111111.11111100.00000000

$(11111111)_B = 2^7+2^6+2^5+2^4+2^3+2^2+2^1+2^0 = 255$

$(11111111)_B = 2^7+2^6+2^5+2^4+2^3+2^2+2^1+2^0 = 255$

$(11111100)_B = 2^7+2^6+2^5+2^4+2^3+2^2 = 252$

$(00000000)_B = 0$

Donc

Le masque décimal : 225.225.252.0

Le masque notation CIDR (en /) : 22

Le nombre de bits de la partie réseau: 22 bits

Le nombre de bits de la la partie machine: $32-22 = 10$ bits

Le nombre de machines : $2^{10} - 2 = 1022$

L'@IP de diffusion réseau : 10010101.01001101.000100 11.11111111 = 149.77.19.255

La plage d'adresses utilisables :

[149.77.16.1 – 149.77.19.254] = [10010101.01001101.00010000.00000000 -> 10010101.01001101.00010011.11111111]

2, L'architecture contient sous-réseaux :

On a :

Les câbles rouge sont des sous-réseaux : 7

Les PC connecter avec les router son un sous-réseaux : 5

Les PC connecter avec un Switch après connecter avec les router son un sous-réseaux : 11

Pour chaque sous-réseau on a (tout en justifiant) :

- Le masque de sous-réseau en binaire et décimal et en notation CIDR (en /) :

On veut adresser 23 sous-réseaux donc il nous faut : 5 bits pour la partie sous-réseau dans l'@IP

On a :

$27-22 = 5$ bits

$2^5=32$ sous-réseaux

$1024 / 32 = 32 - 2$ Machines par réseau

Donc :

10010101.01001101.000100	00.000	00000	/ 27
	Partie sous-réseaux	Partie machine	

1-Le masque sous-réseau en binaire :

En prend 5 bits de pois fort de la partie machine de masque de réseau-mère est en les met a 1 :

11111111.11111111.111111 11.111 00000

Le masque sous-réseau décimal : 225.225.255.224

$(11111111)B = 2^7+2^6+2^5+2^4+2^3+2^2+2^1+2^0 = 225$

$(11111111)B = 2^7+2^6+2^5+2^4+2^3+2^2+2^1+2^0 = 225$

$(11111111)B = 2^7+2^6+2^5+2^4+2^3+2^2+2^1+2^0 = 225$

$(11100000)B = 2^7+2^6+2^5 = 224$

Le masque sous-réseau notation CIDR (en /) : 27

Le nombre de bits de la partie sous-réseau : $32-27 = 5$ bits

Le nombre de bits de la partie machine : $10-5 = 5$ bits

Le nombre maximal de sous-réseaux : 32

Le nombre de machines par réseau: $2^5-2 = 30$

@IP du sous-réseau (décimal et binaire)	Première @IP utilisable	Dernière @IP utilisable	@ de Diffusion
149.77.16.0 (10010101.01001101.00010000.00000000) B	149.77.16.1	149.77.16.30	149.77.16.31
149.77.16.32 (10010101.01001101.00010000.00100000) B	149.77.16.33	149.77.16.62	149.77.16.63
149.77.16.64 (10010101.01001101.00010000.01000000) B	149.77.16.65	149.77.16.94	149.77.16.95
149.77.16.96 (10010101.01001101.00010000.01100000) B	149.77.16.97	149.77.16.158	149.77.16.159
149.77.16.128 (10010101.01001101.00010000.10000000) B	149.77.16.129	149.77.16.30	149.77.16.31
149.77.16.160 (10010101.01001101.00010000.10100000) B	149.77.16.161	149.77.16.190	149.77.16.191
149.77.16.192 (10010101.01001101.00010000.11000000) B	149.77.16.193	149.77.16.222	149.77.16.223
149.77.16.224 (10010101.01001101.00010000.11100000) B	149.77.16.225	149.77.16.30 254	149.77.16.255
149.77.17.0 (10010101.01001101.00010001.00000000) B	149.77.17.1	149.77.17.30	149.77.17.31
149.77.17.32 (10010101.01001101.00010001.00100000) B	149.77.17.33	149.77.17.62	149.77.17.63
149.77.17.64 (10010101.01001101.00010001.01000000) B	149.77.17.65	149.77.17.94	149.77.17.95
149.77.17.96 (10010101.01001101.00010001.01100000) B	149.77.17.97	149.77.17.158	149.77.17.159
149.77.17.128 (10010101.01001101.00010001.10000000) B	149.77.17.129	149.77.17.30	149.77.17.31
149.77.17.160 (10010101.01001101.00010001.10100000) B	149.77.17.171	149.77.17.190	149.77.17.191
149.77.17.192 (10010101.01001101.00010001.11000000) B	149.77.17.193	149.77.17.222	149.77.17.223
149.77.17.224 (10010101.01001101.00010001.11100000) B	149.77.17.225	149.77.17.30 254	149.77.17.255
149.77.18.0 (10010101.01001101.00010010.00000000) B	149.77.18.1	149.77.18.30	149.77.18.31
149.77.18.32 (10010101.01001101.00010010.00100000) B	149.77.18.33	149.77.18.62	149.77.18.63
149.77.18.64 (10010101.01001101.00010010.01000000) B	149.77.18.65	149.77.18.94	149.77.18.95
149.77.18.96 (10010101.01001101.00010010.01100000) B	149.77.18.97	149.77.18.158	149.77.18.159
149.77.18.128 (10010101.01001101.00010010.10000000) B	149.77.18.129	149.77.18.30	149.77.18.31
149.77.18.160 (10010101.01001101.00010010.10100000) B	149.77.18.181	149.77.18.190	149.77.18.191

149.77.18.192 (10010101.01001101.00010010.11000000) B	149.77.18.193	149.77.18.222	149.77.18.223
149.77.18.224 (10010101.01001101.00010010.11100000) B	149.77.18.225	149.77.18.30 254	149.77.18.255
149.77.19.0 (10010101.01001101.00010011.00000000) B	149.77.19.1	149.77.19.30	149.77.19.31
149.77.19.32 (10010101.01001101.00010011.00100000) B	149.77.19.33	149.77.19.62	149.77.19.63
149.77.19.64 (10010101.01001101.00010011.01000000) B	149.77.19.65	149.77.19.94	149.77.19.95
149.77.19.96 (10010101.01001101.00010011.01100000) B	149.77.19.97	149.77.19.158	149.77.19.159
149.77.19.128 (10010101.01001101.00010011.10000000) B	149.77.19.129	149.77.19.30	149.77.19.31
149.77.19.160 (10010101.01001101.00010011.10100000) B	149.77.19.191	149.77.19.190	149.77.19.191
149.77.19.192 (10010101.01001101.00010011.11000000) B	149.77.19.193	149.77.19.222	149.77.19.223
149.77.19.224 (10010101.01001101.00010011.11100000) B	149.77.19.225	149.77.19.30 254	149.77.19.255

4. Réalisez la topologie sur Packet Tracer

5. Donnez les commandes IOS de configuration (en détail) des 10 routeurs

Router 0 :

```
Router>enable
```

```
Router#configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface F
```

```
Router(config)#interface FastEthernet 0/0
```

```
Router(config-if)#ip address 149.77.16.62 255.255.255.224
```

```
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 0/1
Router(config-if)#ip address 149.77.16.30 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 0/2
Router(config-if)#ip address 149.77.16.94 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet2/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
```

```
Router(config-if)#exit
```

Router 1 :

```
Router>enable
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 149.77.16.126 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 1/0
Router(config-if)#ip address 149.77.16.158 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 2/0
Router(config-if)#ip address 149.77.16.222 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet2/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet2/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 3/0
Router(config-if)#ip address 149.77.16.94 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 6/0
Router(config-if)#ip address 149.77.16.254 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
```

%LINK-5-CHANGED: Interface FastEthernet6/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet6/0, changed state to up

Router(config-if)#exit

Router(config)#interface Serial7/0

Router(config-if)#ip address 149.77.17.66 255.255.255.224

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface Serial7/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial7/0, changed state to up

Router(config-if)#exit

Router 2 :

Router>enable

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface F

Router(config)#interface FastEthernet 0/0

Router(config-if)#ip address 149.77.17.158 255.255.255.224

Router(config-if)#no shutdown

Router(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

Router(config-if)#exit

Router(config)#interface Serial6/0

Router(config-if)#ip address 149.77.17.66 255.255.255.224

Router(config-if)#no shutdown

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial6/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial6/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface Serial7/0
```

```
Router(config-if)#ip address 149.77.19.1 255.255.255.224
```

```
Router(config-if)#no shutdown
```

```
Router(config-if)#
```

```
%LINK-5-CHANGED: Interface Serial7/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial7/0, changed state to up
```

```
Router(config-if)#exit
```

Router 3 :

```
Router>enable
```

```
Router#configure terminal
```

```
Enter configuration commands, one per line. End with CNTL/Z.
```

```
Router(config)#interface F
```

```
Router(config)#interface FastEthernet 0/0
```

```
Router(config-if)#ip address 149.77.17.62 255.255.255.224
```

```
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
```

```
Router(config)#interface FastEthernet 1/0
```

```
Router(config-if)#ip address 149.77.17.30 255.255.255.224
```

```
Router(config-if)#no shutdown
```


Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Router(config-if)#exit

Router(config)#interface Serial6/0

Router(config-if)#ip address 149.77.17.98 255.255.255.224

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface Serial6/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial6/0, changed state to up

Router(config-if)#exit

Router 9 :

Router>enable

Router#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface F

Router(config)#interface FastEthernet 1/0

Router(config-if)#ip address 149.77.17.158 255.255.255.224

Router(config-if)#no shutdown

Router(config-if)#

%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Router(config-if)#exit

```
Router(config)#interface Serial4/0
Router(config-if)#ip address 149.77.19.2 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface Serial4/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial4/0, changed state to up
```

```
Router(config-if)#exit
```

Router 8 :

```
Router>enable
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface F
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 149.77.17.158 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 1/0
Router(config-if)#ip address 149.77.17.254 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface F
Router(config)#interface FastEthernet 3/0
Router(config-if)#ip address 149.77.17.222 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0, changed state to up
```

```
Router(config-if)#exit
```

Router 4 :

```
Router>enable
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface F
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 149.77.17.222 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface Serial2/0
Router(config-if)#ip address 149.77.18.1 255.255.255.224
Router(config-if)#no shutdown
```

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

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

```
Router(config-if)#exit
```

```
Router(config)#interface Serial3/0
Router(config-if)#ip address 149.77.18.33 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

```
Router(config-if)#exit
```

Router 5 :

```
Router>enable
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface F
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 149.77.18.222 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface Serial2/0
Router(config-if)#ip address 149.77.18.2 255.255.255.224
Router(config-if)#no shutdown
```

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

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

```
Router(config-if)#exit
```

```
Router(config)#interface Serial3/0
Router(config-if)#ip address 149.77.18.65 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

```
Router(config-if)#exit
```

Router 7 :

```
Router>enable
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface F
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 149.77.18.254 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
```

```
Router(config)#interface Serial2/0
Router(config-if)#ip address 149.77.18.97 255.255.255.224
Router(config-if)#no shutdown
```

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

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

```
Router(config-if)#exit
```

```
Router(config)#interface Serial3/0
Router(config-if)#ip address 149.77.18.66 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

```
Router(config-if)#exit
```

Router 6 :

```
Router>enable
```

```
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface F
Router(config)#interface FastEthernet 0/0
Router(config-if)#ip address 149.77.18.254 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(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
```

```
Router(config-if)#exit
Router(config)#interface F
Router(config)#interface FastEthernet 1/0
Router(config-if)#ip address 149.77.18.158 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
```

```
Router(config-if)#exit
```

```
Router(config)#interface Serial2/0
Router(config-if)#ip address 149.77.18.34 255.255.255.224
Router(config-if)#no shutdown
```

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

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

```
Router(config-if)#exit
```

```
Router(config)#interface Serial3/0
Router(config-if)#ip address 149.77.18.98 255.255.255.224
Router(config-if)#no shutdown
```

```
Router(config-if)#
%LINK-5-CHANGED: Interface Serial3/0, changed state to up
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up
```

```
Router(config-if)#exit
```

6. Saisissez toutes les commandes IOS sur Packet Tracer

7. Les Ping qui marchent :

- Les PC sur le meme resaux marche
- Les PC connecter a un seul router marche

Pourquoi certains ne marchent pas :

- Lors de l'envoi des paquets le pc ne trouve pas une passerelle, donc les pc ne peuvent pas communiquer.
- Il faut alors un routage static.