

**Université Sorbonne Paris Nord**  
**Institut Galilée**  
**Département d'informatique**  
**Master 1**



Rapport de TP2

**Ousmane SOW 11608883**

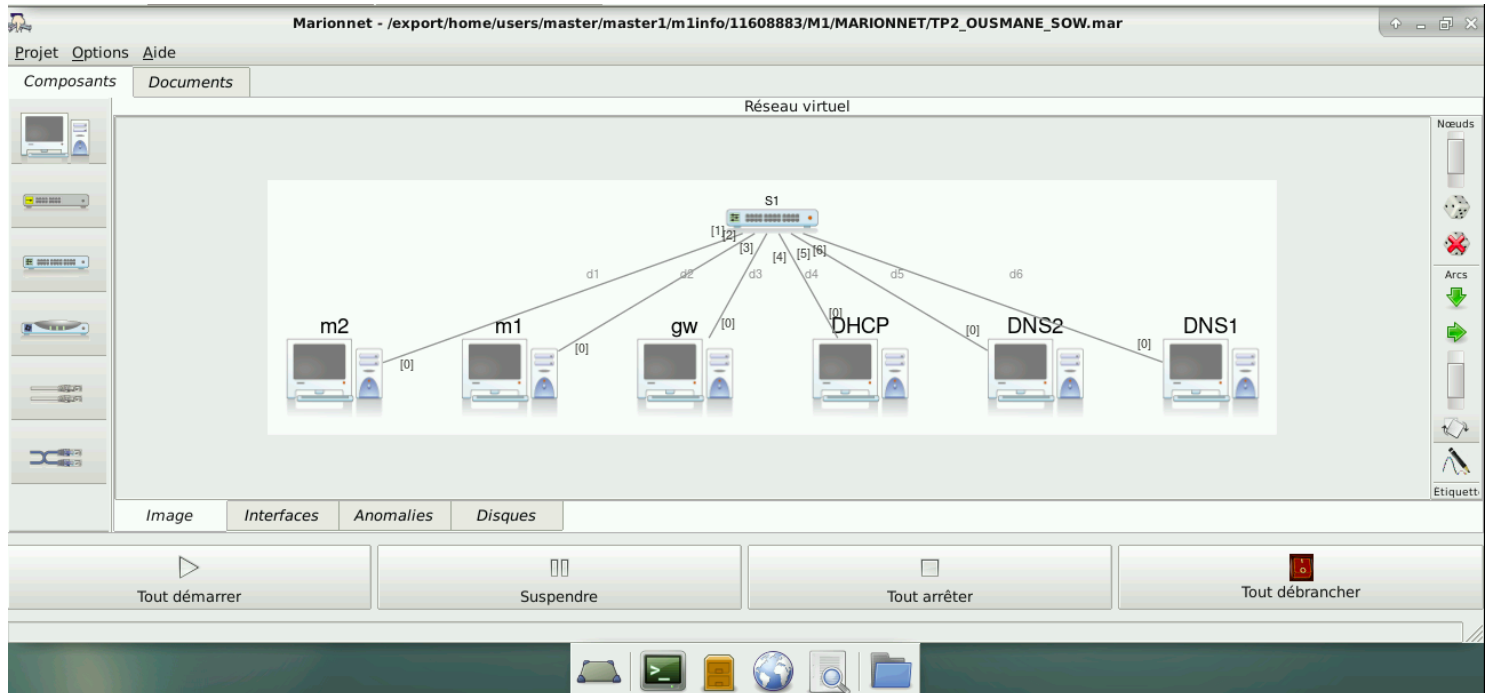
chargé de cours : Mamadou SOW

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# 1 Conception du réseau

Le réseau est composé de 6 machines (virtuelles).



## Paramètres du réseaux

Les adresses IP sont de la plages d'adresses ip privées de la classe C avec un netmask 255.255.255.0

Ici montrons les images des attributions des IP

## Serveur DHCP

```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
DHCP:~# ifconfig eth0 192.168.20.1 netmask 255.255.255.0 up
DHCP:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:8a:f9:8b
          inet addr:192.168.20.1  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fe8a:f98b/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:200 errors:0 dropped:0 overruns:0 frame:0
          TX packets:40 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4980 (4.8 KiB)  TX bytes:1556 (1.5 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:42 errors:0 dropped:0 overruns:0 frame:0
          TX packets:42 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1172 (1.1 KiB)  TX bytes:1172 (1.1 KiB)

DHCP:~#
```

## Serveur DNS1

```
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
DNS1:~# ifconfig eth0 192.168.20.2 netmask 255.255.255.0 up
DNS1:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:bd:a8:a6
          inet addr:192.168.20.2  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:febd:a8a6/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:165 errors:0 dropped:0 overruns:0 frame:0
          TX packets:33 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4350 (4.2 KiB)  TX bytes:1332 (1.3 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:35 errors:0 dropped:0 overruns:0 frame:0
          TX packets:35 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1046 (1.0 KiB)  TX bytes:1046 (1.0 KiB)

DNS1:~#
```

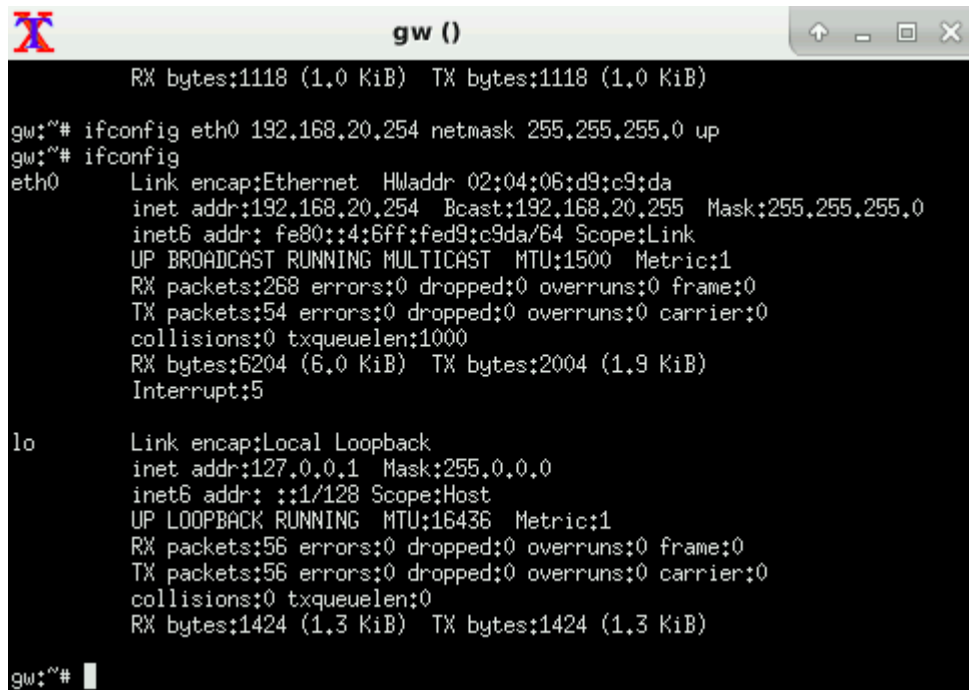
## Serveur DNS2

```
          RX bytes:1010 (1010.0 B)  TX bytes:1010 (1010.0 B)
DNS2:~# ifconfig eth0 192.168.20.3 netmask 255.255.255.0 up
DNS2:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:14:f8:42
          inet addr:192.168.20.3  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fe14:f842/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:160 errors:0 dropped:0 overruns:0 frame:0
          TX packets:32 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:4260 (4.1 KiB)  TX bytes:1300 (1.2 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:34 errors:0 dropped:0 overruns:0 frame:0
          TX packets:34 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1028 (1.0 KiB)  TX bytes:1028 (1.0 KiB)

DNS2:~#
```

## La passerelle GW



```

RX bytes:1118 (1,0 KiB) TX bytes:1118 (1,0 KiB)

gw:~# ifconfig eth0 192.168.20.254 netmask 255.255.255.0 up
gw:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:d9:c9:da
          inet addr:192.168.20.254  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fed9:c9da/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:268 errors:0 dropped:0 overruns:0 frame:0
          TX packets:54 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:6204 (6,0 KiB)  TX bytes:2004 (1,9 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:56 errors:0 dropped:0 overruns:0 frame:0
          TX packets:56 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1424 (1,3 KiB)  TX bytes:1424 (1,3 KiB)

gw:~#
```

Ici mettons les adresses ci-dessus dans un tableau pour plus de lisibilité.

Nom	Adresse IP
Serveur DHCP	192.168.20.1
Serveur DNS1	192.168.20.2
Serveur DNS2	192.168.20.3
La passerelle GW	192.168.20.254
m1	
m2	

## Démarrage du réseau et configuration des trois serveurs et la machine passerelle

### 3.1 Serveur DHCP

modification du fichier interfaces et activation de eth0

```
DHCP:~# cat /etc/network/interfaces
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
    address 192.168.20.1
    netmask 255.255.255.0
DHCP:~# ifup eth0
if-up.d/mountnfs[eth0]: waiting for interface lo before doing NFS mounts
postconf: fatal: open /etc/postfix/main.cf: No such file or directory
DHCP:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:e2:6f:23
          inet addr:192.168.20.1  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fee2:6f23/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:85 errors:0 dropped:0 overruns:0 frame:0
          TX packets:17 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2910 (2.8 KiB)  TX bytes:820 (820.0 B)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:19 errors:0 dropped:0 overruns:0 frame:0
          TX packets:19 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:758 (758.0 B)  TX bytes:758 (758.0 B)

DHCP:~#
```

## 3.2 Serveur DNS1

modification du fichier interfaces et activation de eth0

```
DNS1 () x
DNS1:~# cat /etc/network/interfaces
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
    address 192.168.20.2
    netmask 255.255.255.0

DNS1:~# ifup eth0
if-up.d/mountnfs[eth0]: waiting for interface lo before doing NFS mounts
postconf: fatal: open /etc/postfix/main.cf: No such file or directory
DNS1:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:21:b6:33
          inet addr:192.168.20.2  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fe21:b633/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:105 errors:0 dropped:0 overruns:0 frame:0
          TX packets:21 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3270 (3.1 KiB)  TX bytes:948 (948.0 B)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:23 errors:0 dropped:0 overruns:0 frame:0
          TX packets:23 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:830 (830.0 B)  TX bytes:830 (830.0 B)

DNS1:~#
```

### 3.3 Serveur DNS2

modification du fichier interfaces et activation de eth0

```
DNS2 ()
DNS2:~# cat /etc/net
netatalk/ netgroup network/ networks
DNS2:~# cat /etc/network/interfaces
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
    address 192.168.20.3
    netmask 255.255.255.0
DNS2:~# ifup eth0
if-up.d/mountnfs[eth0]: waiting for interface lo before doing NFS mounts
postconf: fatal: open /etc/postfix/main.cf: No such file or directory
DNS2:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:89:9f:05
          inet addr:192.168.20.3  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fe89:9f05/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:125 errors:0 dropped:0 overruns:0 frame:0
          TX packets:25 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:3630 (3.5 KiB)  TX bytes:1076 (1.0 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:27 errors:0 dropped:0 overruns:0 frame:0
          TX packets:27 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:902 (902.0 B)  TX bytes:902 (902.0 B)

DNS2:~#
```



### 3.4 La passerelle gw

modification du fichier interfaces et activation de eth0

```
gw () x
gw:~# cat /etc/network/interfaces
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
address 192.168.20.254
netmask 255.255.255.0

gw:~# ifup eth0
if-up.d/mountnfs[eth0]: waiting for interface lo before doing NFS mounts
postconf: fatal: open /etc/postfix/main.cf: No such file or directory
gw:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:41:98:14
          inet addr:192.168.20.254  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fe41:9814/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:250 errors:0 dropped:0 overruns:0 frame:0
          TX packets:50 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:5880 (5.7 KiB)  TX bytes:1876 (1.8 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:52 errors:0 dropped:0 overruns:0 frame:0
          TX packets:52 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1352 (1.3 KiB)  TX bytes:1352 (1.3 KiB)

gw:~#
```

## 2 Mise en place d'un service DHCP

Configuration sur la machine DHCP le fichier */etc/dhcp3/dhcpd.conf* pour l'adapter a notre réseau

### Configuration pour la plage dynamique

```
# This is a very basic subnet declaration.

subnet 192.168.20.0 netmask 255.255.255.0 {
    range 192.168.20.10 192.168.20.20;
    option routers 192.168.20.254;
}
```

## Configuration statique pour la machine m2

affichage de l'adresse physique de la machine m2

```
m2 ()
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
m2:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:c2:00:fd
          inet6 addr: fe80::4:6ff:fec2:fd/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:86 errors:0 dropped:0 overruns:0 frame:0
          TX packets:17 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:2928 (2.8 KiB)  TX bytes:820 (820.0 B)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:19 errors:0 dropped:0 overruns:0 frame:0
          TX packets:19 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:758 (758.0 B)  TX bytes:758 (758.0 B)

m2:~#
```

modification du fichier `/etc/dhcp3/dhcpd.conf`

```
# Fixed IP addresses can also be specified for hosts.  These addresses
# should not also be listed as being available for dynamic assignment.
# Hosts for which fixed IP addresses have been specified can boot using
# BOOTP or DHCP.  Hosts for which no fixed address is specified can only
# be booted with DHCP, unless there is an address range on the subnet
# to which a BOOTP client is connected which has the dynamic-bootp flag
# set.
host m2 {
    hardware ethernet 02:04:06:c2:00:fd;
    fixed-address 192.168.20.25;
}
```

## Test pour le serveur DHCP

On test avec la commande `dhcpd3 -d` pour déboguer le fichier

```
DHCP ()
DHCP:~# dhcpd3 -d
Internet Systems Consortium DHCP Server V3.1.1
Copyright 2004-2008 Internet Systems Consortium.
All rights reserved.
For info, please visit http://www.isc.org/sw/dhcp/
Wrote 0 deleted host decls to leases file.
Wrote 0 new dynamic host decls to leases file.
Wrote 0 leases to leases file.
Listening on LPF/eth0/02:04:06:e2:6f:23/192.168.20/24
Sending on   LPF/eth0/02:04:06:e2:6f:23/192.168.20/24
Sending on   Socket/fallback/fallback-net
```

on demare le serveur DHCP avec la commande `/etc/init.d/dhcp3-server start`

```
DHCP:~# /etc/init.d/dhcp3-server start
Starting DHCP server: dhcpd3.
DHCP:~#
```

on active eth0 de la machine m1 avec la commande `ifup` et on vérifie avec la commande `ifconfig` si le serveur DHCP a bien attribué une adresse Ip.



```
m1 ()
permitted by applicable law.
m1:~# ifup eth0
Internet Systems Consortium DHCP Client V3.1.1
Copyright 2004-2008 Internet Systems Consortium.
All rights reserved.
For info, please visit http://www.isc.org/sw/dhcp/

Listening on LPF/eth0/02:04:06:06:db:88
Sending on   LPF/eth0/02:04:06:06:db:88
Sending on   Socket/Fallback
DHCPDISCOVER on eth0 to 255.255.255.255 port 67 interval 3
DHCPOFFER from 192.168.20.1
DHCPREQUEST on eth0 to 255.255.255.255 port 67
DHCPACK from 192.168.20.1
bound to 192.168.20.10 -- renewal in 259 seconds.
if-up.d/mountnfs[eth0]: waiting for interface lo before doing NFS mounts
postconf: fatal: open /etc/postfix/main.cf: No such file or directory
m1:~# ifconfig
eth0      Link encap:Ethernet  HWaddr 02:04:06:06:db:88
          inet addr:192.168.20.10  Bcast:192.168.20.255  Mask:255.255.255.0
          inet6 addr: fe80::4:6ff:fe06:db88/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:331 errors:0 dropped:0 overruns:0 frame:0
          TX packets:74 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:8668 (8.4 KiB)  TX bytes:3520 (3.4 KiB)
          Interrupt:5

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:66 errors:0 dropped:0 overruns:0 frame:0
          TX packets:66 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1604 (1.5 KiB)  TX bytes:1604 (1.5 KiB)

m1:~#
```

Sur la capture d'écran on voit le serveur DHCP a attribue la première adresse de la plage a la machine m1.

on active eth0 de la machine m2 avec la commande `ifup` et on vérifie avec la commande `ifconfig` si le serveur DHCP a bien attribué une adresse Ip.

Le serveur DHCP a attribué l'adresse IP fixe définie au préalable sur le fichier de configuration à la machine m2.

### 3 Mise en place du service DNS

Le serveur DNS1 est le serveur primaire de la zone

#### Configuration sur le serveur DNS1

- 1 ajout des deux zones sur le fichier */etc/bind/named.conf* pour la résolution directe et inverse

```
zone "255.in-addr.arpa"{
    type master;
    file "/etc/bind/db.255";
};
// ajout du domaine sow.sow-ousmane.fr pour la résolution directe
zone "sow.sow-ousmane.fr"{
    type master;
    file "/etc/bind/db.sow.sow-ousmane.fr";
};
//20.168.192.in-addr.arpa pour la résolution inverse
zone "20.168.192.in-addr.arpa"{
    type master;
    file "/etc/bind/db.sow.sow-ousmane.fr.rev";
};
```

2. création sur le serveur DNS1 le fichier */etc/bind/db.sow.sow-ousmane.fr* pour la gestion de la zone directe.

```
DNS1: # cat /bind/db.sow.sow-ousmane.fr
; BIND reverse data file for empty rfc1918 zone
;
; DO NOT EDIT THIS FILE -it is used for multiple zones.
; Instead, copy it, edit named.conf, and use that copy.
;
$TTL      86400
@         IN      SOA      localhost. root.localhost. (
                        1          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        86400)     ; Negative Cache TTL
;
DNS1      IN      NS       DNS1.sow.sow-ousmane.fr.
gw        IN      A        192.168.20.2
m1        IN      A        192.168.20.254
m2        IN      A        192.168.20.10
m2        IN      A        192.168.20.25
```

3. création sur le serveur DNS1 le fichier */etc/bind/db.sow.sow-ousmane.fr.rev* pour la gestion de la zone reverse.

```
DNS1: # cat /bind/db.sow.sow-ousmane.fr.rev
; BIND reverse data file for empty rfc1918 zone
;
; DO NOT EDIT THIS FILE -it is used for multiple zones.
; Instead, copy it, edit named.conf, and use that copy.
;
$TTL      86400
@         IN      SOA      localhost. root.localhost. (
                        1          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        86400)     ; Negative Cache TTL
;
2         IN      NS       DNS1.sow.sow-ousmane.fr.
254       IN      PTR      DNS1.sow.sow-ousmane.fr.
10        IN      PTR      gw.sow.sow-ousmane.fr.
25        IN      PTR      m1.sow.sow-ousmane.fr.
25        IN      PTR      m2.sow.sow-ousmane.fr.
```

4. On lance le service DNS avec la commande */etc/init.d/bind9 start*

pour la capture d'écran c'est une redémarrage car le service était déjà lancé

```
DNS1:~# vi/etc/bind/db.sow.sow-ousmane.fr
DNS1:~# /etc/init.d/bind9 restart
Stopping domain name service...: bind.
Stopping domain name service...: bind.
DNS1:~# nslookup 192.168.20.254
```

- 2 On modifie le fichier `/etc/resolv.conf` de DNS1 pour que le domaine internet et de recherche soit `sow.sow-ousmane.fr` et le serveur de nom sa propre adresse.

```
DNS1:~# cat/etc/resolv.conf
domain sow.sow-ousmane.fr
search sow.sow-ousmane.fr
nameserver 192.168.28.2

DNS1:~#
```

## Test de fonctionnement du service DNS

On test le service avec les commandes `ping` et `nslookup`

```
DNS1:~# nslookup 192.168.20.25
Server:      192.168.20.2
Address:     192.168.20.2#53

25.20.168.192.in-addr.arpa      name = m2.sow.sow-ousmane.fr.

DNS1:~# nslookup m1
Server:      192.168.20.2
Address:     192.168.20.2#53

Name:  m1.sow.sow-ousmane.fr
Address: 192.168.20.10

DNS1:~#
```

```
DNS1:~# ping m1
PING m1.sow.sow-ousmane.fr (192.168.20.10) 56(84) bytes of data.
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=1 ttl=64 time=20.5 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=2 ttl=64 time=0.202 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=3 ttl=64 time=0.222 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=4 ttl=64 time=0.249 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=5 ttl=64 time=0.233 ms

-- m1.sow.sow-ousmane.fr ping statistics --
5 packets transmitted, 5 received, 0% packet loss, time 4047ms
rtt min/avg/max/mdev = 0.202/4.281/20.501/8.110 ms
DNS1:~#
```

Pour que m1 puisse communiquer directement avec m2 il faut :

- On ajoute sur le serveur DHCP le nom du domaine et l'adresse du serveur de noms

```
#      deny members of "foo";
#      range 10.0.29.10 10.0.29.230;
#    }
#}
option domain-name "sow.sow-ousmane.fr";
option domain-name-server 192.168.20.2;

DHCP:~#
```

- On redémarre le serveur DHCP et on désactive eth0 sur les machines m1 et m 2 ensuite on les active pour qu'elles prennent en compte des modifications sur le domaine de recherche.
- Ainsi le fichier */etc/resolv.conf* s'est mis automatiquement à jour sur les machines m1 et m 2

```
m2:~# cat /etc/resolv.conf
domain sow.sow-ousmane.fr
domain sow.sow-ousmane.fr
nameserver 192.168.20.2
m2:~#
```

En fin les pings de m1 vers m 2 et m 2 vers m1

```
m2:~# ping m1
PING m1.sow.sow-ousmane.fr (192.168.20.10) 56(84) bytes of data.
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=1 ttl=64 time=20.4 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=2 ttl=64 time=0.272 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=3 ttl=64 time=0.284 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=4 ttl=64 time=0.274 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=5 ttl=64 time=0.292 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=6 ttl=64 time=0.220 ms
64 bytes from m1.sow.sow-ousmane.fr (192.168.20.10): icmp_seq=7 ttl=64 time=0.243 ms

--- m1.sow.sow-ousmane.fr ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6048ms
rtt min/avg/max/mdev = 0.220/3.144/20.424/7.054 ms
m2:~#
```

```
m1:~# ping m2
PING m2.sow.sow-ousmane.fr (192.168.20.25) 56(84) bytes of data.
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=1 ttl=64 time=20.4 ms
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=2 ttl=64 time=0.272 ms
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=3 ttl=64 time=0.284 ms
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=4 ttl=64 time=0.274 ms
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=5 ttl=64 time=0.292 ms
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=6 ttl=64 time=0.260 ms
64 bytes from m2.sow.sow-ousmane.fr (192.168.20.25): icmp_seq=7 ttl=64 time=0.262 ms
```

## Configuration sur le serveur DNS2

– le serveur DNS2 est le serveur secondaire

- 1 On configure le fichier */etc/resolv.conf* pour la résolution de noms

```
DNS2:~# cat /etc/resolv.conf
nameserver 192.168.20.2
domain sow.sow-ousmane.fr
search sow.sow-ousmane.fr
DNS2:~#
```

- 2 On ajoute le serveur DNS2 dans les table de DNS1 et on vérifie avec la commande nslookup

```

DNS1:~# nslookup DNS2
Server:      192.168.20.2
Address:     192.168.20.2#53

Name:   DNS2.sow.sow-ousmane.fr
Address: 192.168.20.3

DNS1:~# nslookup 192.168.20.3
Server:      192.168.20.2
Address:     192.168.20.2#53

3.20.168.192.in-addr.arpa      name = DNS2.sow.sow-ousmane.fr.

DNS1:~#

```

- 3 Sur DNS1 on autorise le transfert de zones vers ns2 en éditant le fichier */etc/bind/named.conf* et en ajoutant la ligne `allow-transfer { 192.168.20.3;};`

```

};
// ajout du domaine sow.sow-ousmane.fr pour la resolution directe
zone "sow.sow-ousmane.fr"{
    type master;
    file "/etc/bind/db.sow.sow-ousmane.fr";
    allow-transfer{192.168.20.2;};
};

//20.168.192.in-addr.arpa pour la resolution inverse

```

- 4 On ajoute dans la zone directe et la zone reverse de DNS1, un enregistrement de type NS pointant sur sow.sow-ousmane.fr



```

DNS1:~# cat /etc/bind/db.sow.sow-ousmane.fr.rev
; BIND reverse data file for empty rf1918 zone
;
; DO NOT EDIT FILE - it is used for multiple zones.
; Instead, copy it, edit named.conf, and use that copy.
;
$TTL      86400
@         IN      SOA      localhost. root.localhost. (
                        1          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        86400 )    ; Negative Cache TTL

                        IN      NS      DNS1.sow.sow-ousmane.fr.
                        IN      NS      DNS2.sow.sow-ousmane.fr.

2         IN      PTR      DNS1.sow.sow-ousmane.fr.
254       IN      PTR      gw.sow.sow-ousmane.fr.
10        IN      PTR      m1.sow.sow-ousmane.fr.
25        IN      PTR      m2.sow.sow-ousmane.fr.
3         IN      PTR      DNS2.sow.sow-ousmane.fr.

```

```

; BIND reverse data file for empty rf1918 zone
;
; DO NOT EDIT FILE - it is used for multiple zones.
; Instead, copy it, edit named.conf, and use that copy.
;
$TTL      86400
@         IN      SOA      localhost. root.localhost. (
                        1          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        86400 )    ; Negative Cache TTL

                        IN      NS      DNS1.sow.sow-ousmane.fr.
                        IN      NS      DNS1.sow.sow-ousmane.fr.

DNS1      IN      A        192.168.20.2
gw        IN      A        192.168.20.254
m1        IN      A        192.168.20.10
m2        IN      A        192.168.20.25
DNS2      IN      A        192.168.20.3

```

- 5 On relance le service DNS sur DNS1 pour prendre en compte les modifications avec la commande `/etc/init.d/bind9 restart`

```

DNS1 ()
DNS1:~# /etc/init.d/bind9 restart
Stopping domain name service...: bind.
Starting domain name service...: bind.
DNS1:~#

```

## 6 Sur DNS2 on édite le fichier `/etc/bind/named.conf`

```
// root-delegation-only exclude {"DE"; "MUSEUM"; };
zone "sow.sow-ousmane.fr" {
    type slave;
    file "/etc/bind/db.sow.sow-ousmane.fr";
    masters { 192.168.20.2; };
};
zone "20.168.192.in-addr.arpa" {
    type slave;
    file "/etc/bind/db.sow.sow-ousmane.fr";
    masters { 192.168.20.2; };
};

include "/etc/bind/named.conf.local";
```

```
DNS2:~# /etc/init.d/bind9 start
Starting domain name service...: bind.
DNS2:~# cd /etc/bind
DNS2:/etc/bind# ls
db.0      db.255      db.empty    db.root      named.conf.local  rndc.key
db.127    db.sow.sow-ousmane.fr  db.local     named.conf    named.conf.options  zones.rfc1918
```

- 7 On démarre le service DNS du serveur DNS2 par la commande `/etc/init.d/bind9 start` et le transfert de zone s'effectue automatiquement sur le serveur DNS2, en transférant les fichiers `.db` de DNS1

## Test de fonctionnement du service DNS du serveur DNS2

On test avec la commande `nslookup` sur le DNS2 pour vérifier le fonctionnement du DNS secondaire.

```
DNS2:/etc/bind# nslookup
> DNS1
Server:      192.168.20.2
Address:     192.168.20.2#53

Name:   DNS1.sow.sow-ousmane.fr
Address: 192.168.20.2
> DNS2
Server:      192.168.20.2
Address:     192.168.20.2#53

Name:   DNS2.sow.sow-ousmane.fr
Address: 192.168.20.3
> m1
server:     192.168.20.2
Address:    192.168.20.2#53

Name:   m1.sow.sow-ousmane.fr
Address: 192.168.20.10
> m2
Server:     192.168.20.2
Address:    192.168.20.2#53

Name:   m2.sow.sow-ousmane.fr
Address: 192.168.20.25
>
```

- On ajoute sur le serveur DHCP le nom du domaine et l'adresse du serveur de noms

```
# match if substring (option vendor-class-identifier, 0, 4) = "SUNW";
#}

#shared-network 224-29 {
# subnet 10.17.224.0 netmask 255.255.255.0 {
#   option routers rtr-224.example.org;
# }
# subnet 10.0.29.0 netmask 255.255.255.0 {
#   option routers rtr-29.example.org;
# }
# pool {
#   allow members of "foo";
#   range 10.17.224.10 10.17.224.250;
# }
# pool {
#   deny members of "foo";
#   range 10.0.29.10 10.0.29.230;
# }
#}
#option domain-name "sow.sow-ousmane.fr";
#option domain-name-servers 192.168.20.2 192.168.20.3;
```