TP DNS

> Riboulet Célian S3B"

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2) DHCP setup on LAN USER machines

In `/etc/network/interfaces` for dns1 dns2 client1 client2

```
iface eth0 inet dhcp
```

All addresses are set by the dhcp server on root

3) Adresses

```
dns1 : 192.168.0.1
dns2 : 192.168.0.2
client1 : 192.168.0.10
client2 : 192.168.0.20
```

4) Ping between LAN USER machines

5) Routing tables

```
┌──(root♦debian)-[~]
└─# route
Table de routage IP du noyau
Destination     Passerelle      Genmask         Indic Metric Ref    Use Iface
default         192.168.0.254   0.0.0.0         UG    0      0        0 eth0
192.168.0.0     0.0.0.0         255.255.255.0   U     0      0        0 eth0
```

---

7) Changing local host name

In **dns1** `/etc/hosts`

```
192.168.0.2     dns2
192.168.0.10    client1
192.168.0.20    client2
```

8) Ping using hostname

> From dns1

```
┌──(root♦debian)-[~]
└─# ping dns2
PING dns2 (192.168.0.2) 56(84) bytes of data.
64 bytes from dns2 (192.168.0.2): icmp_seq=1 ttl=64 time=0.548 ms
64 bytes from dns2 (192.168.0.2): icmp_seq=2 ttl=64 time=1.47 ms
```

9) /etc/resolv.conf

> Checking the file on all machines

```
 GNU nano 5.4
nameserver 172.16.0.3
```

10) Forcing to use our own dns server

> Editing `/etc/dhcp/dhclient.conf`

On **dns1** and **dns2** :

```
supersede domain-name-servers 127.0.0.1;
```

On **client1** :

```
supersede domain-name-servers 192.168.0.1;
```

On **client2** :

```
supersede domain-name-servers 192.168.0.2;
```

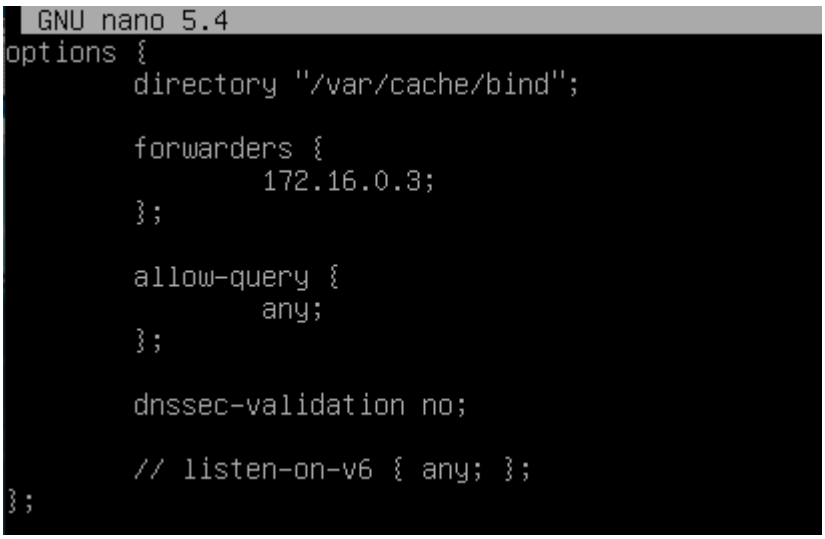
11) Restarting interfaces on all machines

After `ifdown eth0 && ifup eth0` the content of `/etc/resolv.conf` is now :

- for **dns1** and **dns2** :
  - ```
    nameserver 127.0.0.1
    ```
- for **client1** :
  - ```
    nameserver 192.168.0.1
    ```
- for **client2** :
  - ```
    nameserver 192.168.0.2
    ```

12) DNS forwarding

`/etc/bind/named.conf.options` on **dns1** and **dns2** :



13) Configuring primary server (dns1)

> Add add a new dns zone on `/etc/bind/named.conf.loal`
    ```

```
zone "netas" {
    type master;
    file "/etc/bind/db.netas";
};
```

14) Filling dns zone file

```
cp /etc/bind/db.empty /etc/bind/db.netas
```

15) Updating zone file header

+16) Adding NS entry

`/etc/bind/db.netas`

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
```

17) Adding `A` entry

`/etc/bind/db.netas`

```
@       IN      SOA     dns1.netas. contact.netas. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
dns1    IN      A       192.168.0.1
```

18) Restarting the DNS service

```
systemctl restart named
```

> We can also just reload the configuration without having to restart

```
systemctl reload named
```

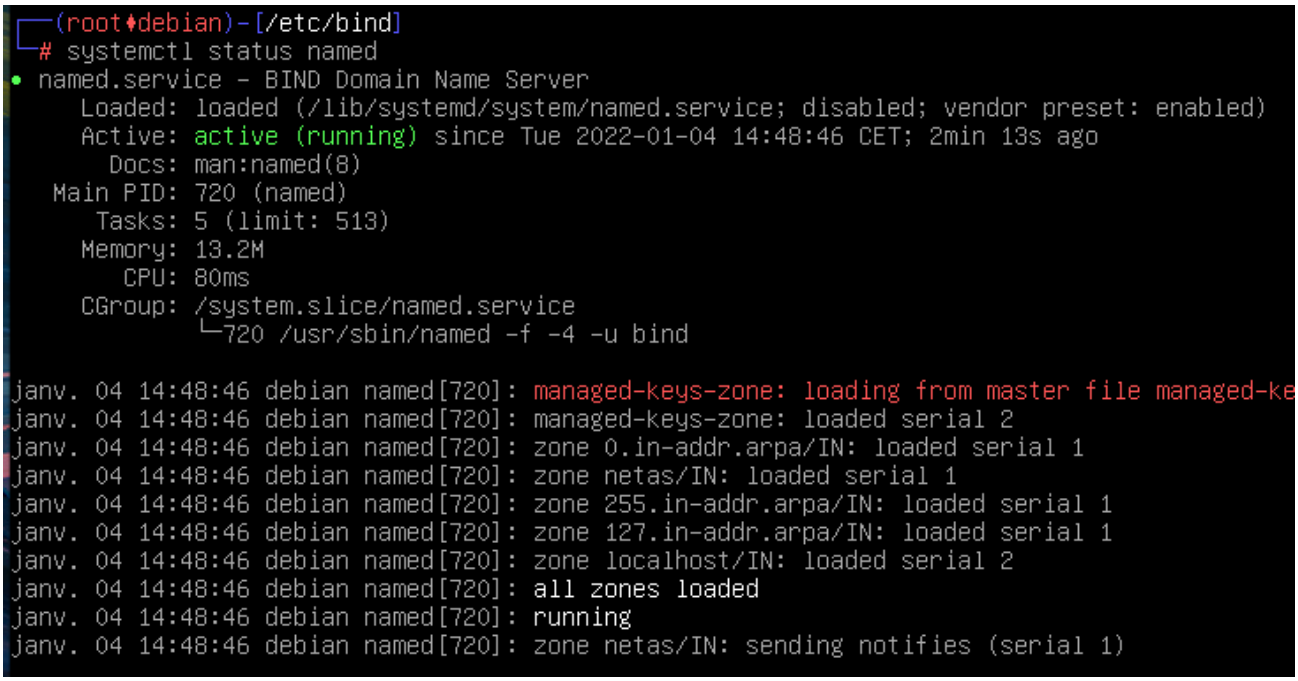
> Check possible errors with :

```
journalctl -u named
```

19) Checking status

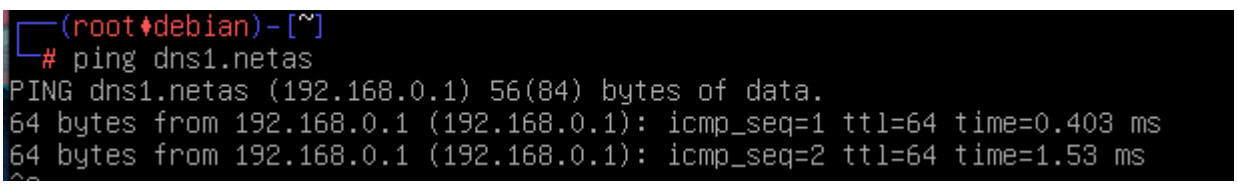
> To check the service status

```
systemctl status named
```



20) Ping from client to dns1 using its domain name

> From **client1**



21) Adding `A` entry for dns2

> The file is still `/etc/bind/db.netas`

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
dns1    IN      A       192.168.0.1
dns2    IN      A       192.168.0.2
```

Dont forget to increment the Serial number and `systemctl reload named`

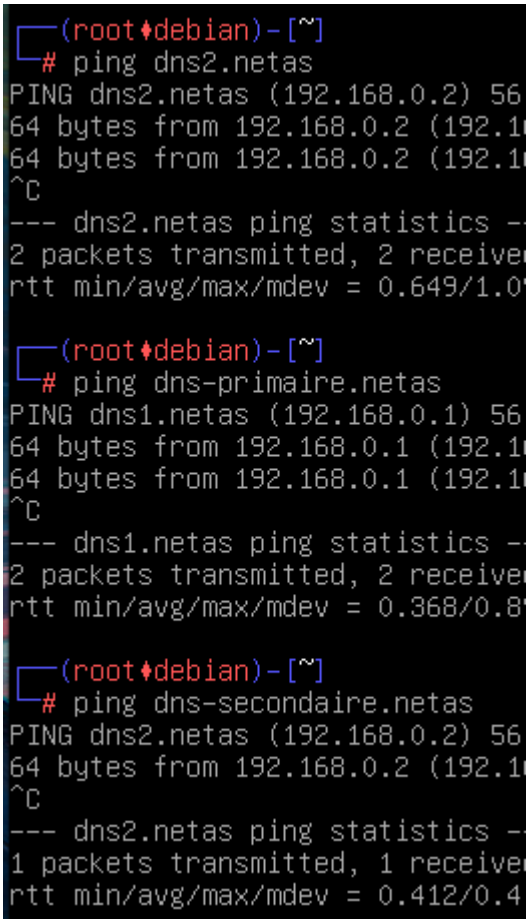
22) Adding `CNAME` entries (aliases)

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              3         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
dns1    IN      A       192.168.0.1
dns2    IN      A       192.168.0.2
dns-primaire    IN      CNAME   dns1
dns-secondaire  IN      CNAME   dns2
```

`<increment> Serial + systemctl reload named`

23) Testing config from client

> On **client1**



24) Adding an `NS` entry to identify dns2 as a zone

`/etc/bind/db.netas`

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              4         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
@       IN      NS      dns2
dns1    IN      A       192.168.0.1
dns2    IN      A       192.168.0.2
dns-primaire    IN      CNAME   dns1
dns-secondaire  IN      CNAME   dns2
```

25) Setting up netas as secondary on dns2

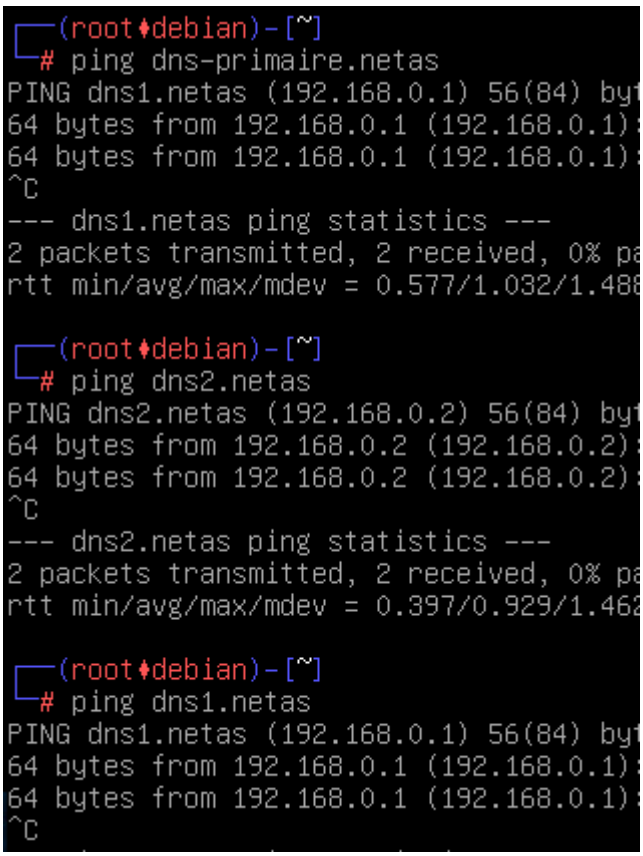
> On `/etc/bind/named.conf.local`

```
zone "netas" {
    type slave;
    file "/var/lib/bind/db.netas";
    masters { 192.168.0.1; };
};
```

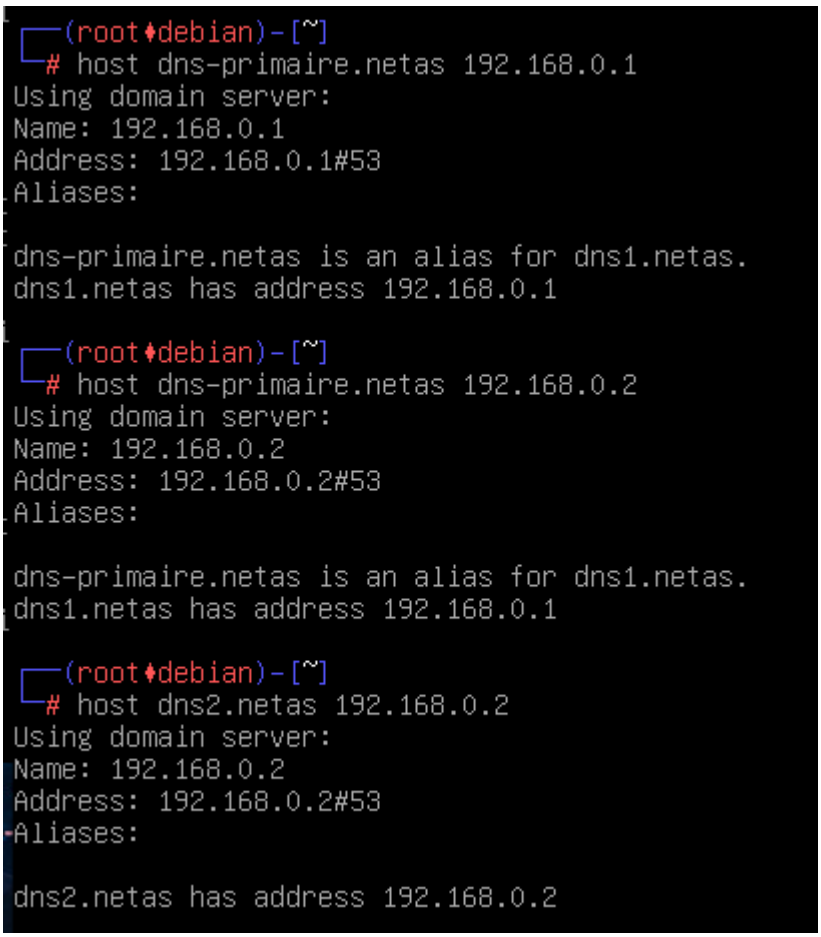
26) Starting up DNS2 and checking with ping

```
systemctl restart named
```

Then on **client2** :



27) Using `host` command on clients



28) Comparing dns2 and dns1 `db.netas` file

The file on dns2 seams to have the same content as dns1 but in another format (Compressed ?)

29) What is a /22 netmask

A /22 netmask is a mask has 22 bits dedicated to identify the network and the others are used to identify the computer.

192.168.0.(0-255)

192.168.1.(0-255)

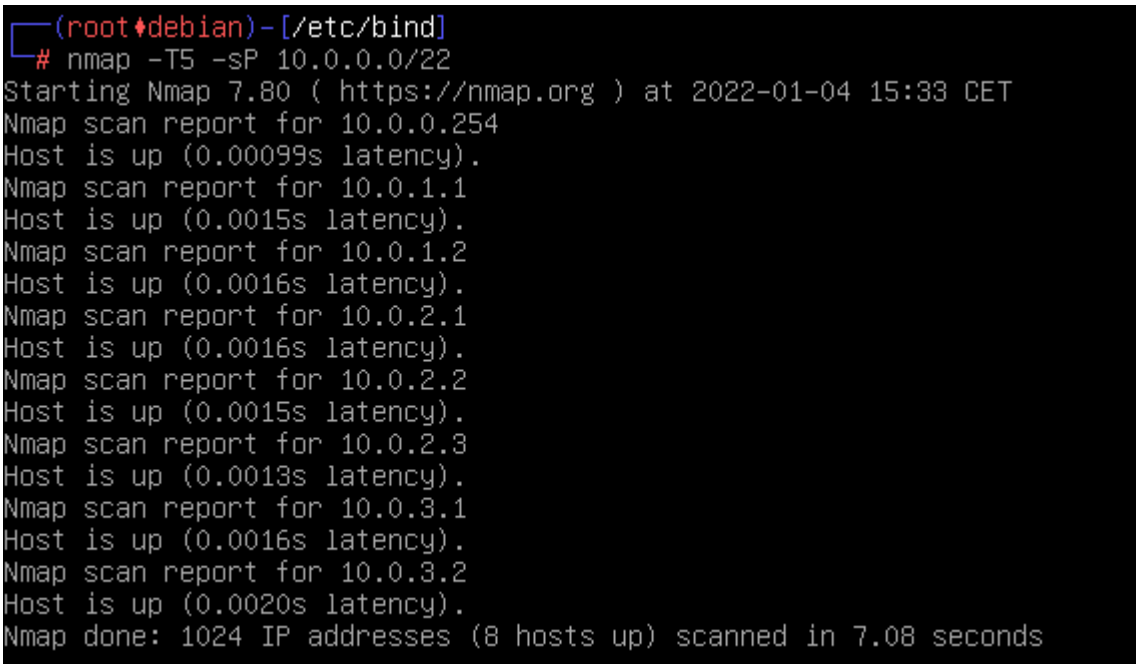
192.168.2.(0-255)

192.168.3.(0-255)

30) Scanning the network to get all IPs

On **dns1** :

```
nmap -T5 -sP 10.0.0.0/22
```



31) Connect over ssh to all found IPs

```
ssh tc@<ip>
```

```
10.0.0.254   root
10.0.1.1     a1
10.0.1.2     a2
10.0.2.1     s1
10.0.2.2     s2
10.0.2.3     s3
10.0.3.1     p1
10.0.3.2     p2
```

32) Add an `A` entry for `s1` `s2` and `s3` web servers

`/etc/bind/db.netas`

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              5_        ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
@       IN      NS      dns2
dns1    IN      A       192.168.0.1
dns2    IN      A       192.168.0.2
s1      IN      A       10.0.2.1
s2      IN      A       10.0.2.2
s3      IN      A       10.0.2.3
dns-primaire    IN      CNAME   dns1
dns-secondaire  IN      CNAME   dns2
```

> Serial number bumped up to 5
>
> `systemctl restart named`

33) Add a `CNAME` entry for the 3 web servers

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              6         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
@       IN      NS      dns2
dns1    IN      A       192.168.0.1
dns2    IN      A       192.168.0.2
s1      IN      A       10.0.2.1
s2      IN      A       10.0.2.2
s3      IN      A       10.0.2.3
dns-primaire    IN      CNAME   dns1
dns-secondaire  IN      CNAME   dns2
creative        IN      CNAME   s1
grayscale       IN      CNAME   s2
wonder          IN      CNAME   s3
```

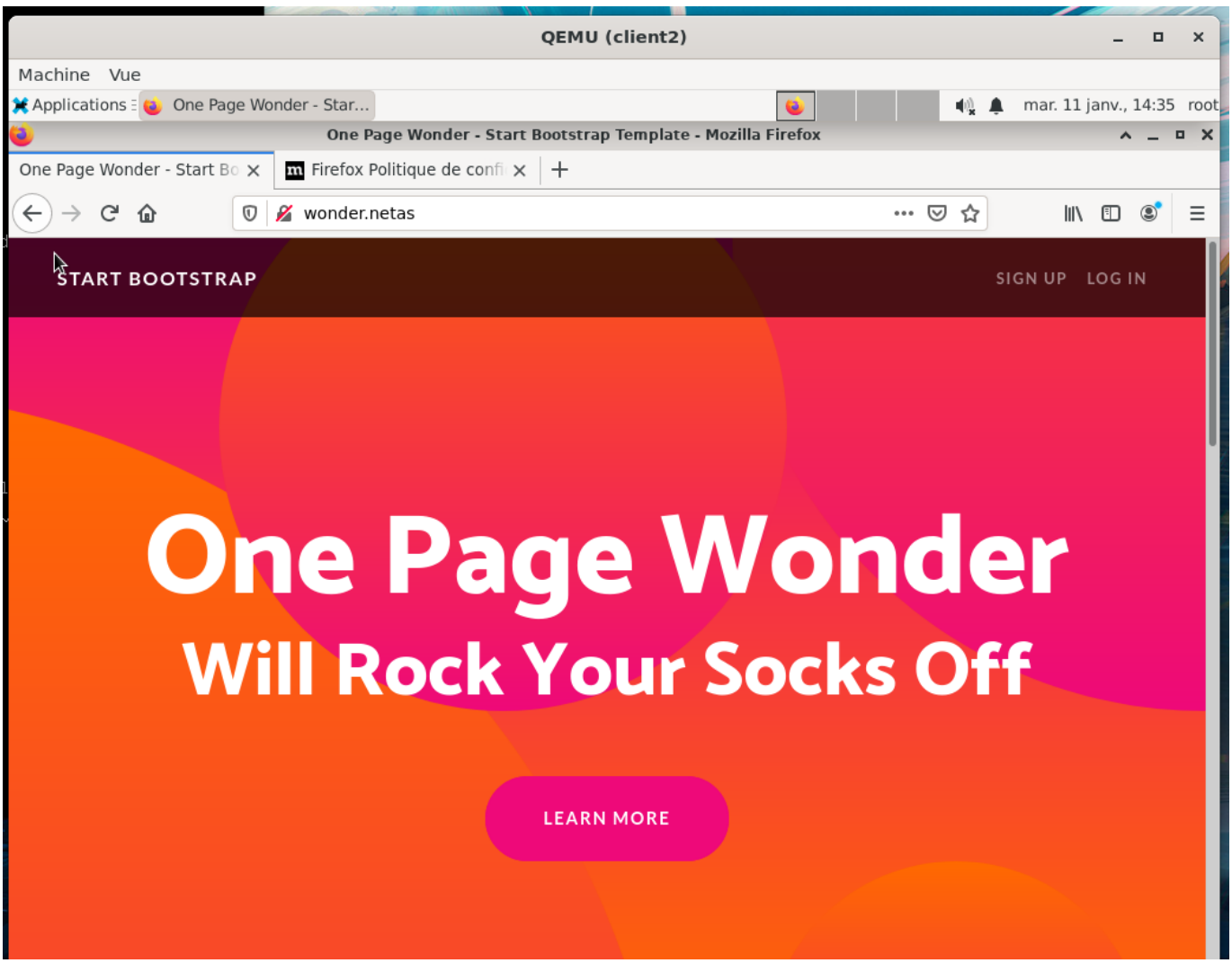
34) Test from client1 and client2

```
┌──(root♦debian)-[~]
└─# ping grayscale.netas
PING s2.netas (10.0.2.2) 56(84) bytes of data.
64 bytes from 10.0.2.2 (10.0.2.2): icmp_seq=1 ttl=63 time=0.887 ms
^C
--- s2.netas ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 0.887/0.887/0.887/0.000 ms

┌──(root♦debian)-[~]
└─# ping wonder.netas
PING s3.netas (10.0.2.3) 56(84) bytes of data.
64 bytes from 10.0.2.3 (10.0.2.3): icmp_seq=1 ttl=63 time=1.20 ms
^C
--- s3.netas ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 1.198/1.198/1.198/0.000 ms
```

35) 36) 37) Start web browser on client 1 and then client2

```
startx
```



38) Declaring inverse domain name zone for netas

> `/etc/bind/named.conf.local` on `dns1`

```
zone "2.0.10.in-addr.arpa" {
        type master;
        file "/etc/bind/db.netas-rev;
};
```

> `/etc/bin/db.netas-rev`

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      dns1.netas.
@       IN      NS      dns2.netas.
1       IN      PTR     s1.netas.
2       IN      PTR     s2.netas.
3       IN      PTR     s3.netas.
```

39) Check on client if the reverse domain name is working

> On client2

```
┌──(root♦debian)-[~]
└─# host 10.0.2.1
1.2.0.10.in-addr.arpa domain name pointer s1.netas.
```

40) Update dns2 configuration

> In order for dns2 to become a secondary server on the reverse netas zone

`/etc/bind/named.conf.local`

```
zone "netas" {
        type slave;
        file "/var/lib/bind/db.netas";
        masters { 192.168.0.1; };
};


zone "2.0.10.in-addr.arpa" {
        type slave;
        file "/var/lib/bind/db.netas-rev";
        masters { 192.168.0.1; };
};
```

41) Testing on client2

```
┌──(root♦debian)-[~]
└─# host 10.0.2.1
;; connection timed out; no servers could be reached


┌──(root♦debian)-[~]
└─# host 10.0.2.1
1.2.0.10.in-addr.arpa domain name pointer s1.netas.
```

> Before and after the setup

42) Add new NS entry to the netas zone (subdomain setup)

```
$TTL    86400
@       IN      SOA     dns1.netas. contact.netas. (
                              7         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      localhost.
@       IN      NS      dns1
@       IN      NS      dns2
dns1    IN      A       192.168.0.1
dns2    IN      A       192.168.0.2
s1      IN      A       10.0.2.1
s2      IN      A       10.0.2.2
s3      IN      A       10.0.2.3
dns-primaire    IN      CNAME   dns1
dns-secondaire  IN      CNAME   dns2
creative        IN      CNAME   s1
grayscale       IN      CNAME   s2
wonder          IN      CNAME   s3
perf    IN      NS      dns1
```

43) Declaring the new subdomain

`/etc/bind/named.conf.local`

```
zone "netas" {
        type master;
        file "/etc/bind/db.netas";
};

zone "2.0.10.in-addr.arpa" {
        type master;
        file "/etc/bind/db.netas-rev";
};

zone "perf.natas" {
        type master;
        file "/etc/bind/db.perf.netas";
};
```

44) Creating zone file

`/etc/bind/db.perf.netas`

```
$TTL    86400
@       IN      SOA     dns1.perf.netas. contact.netas. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      dns1
dns1    IN      A       192.168.0.1
```

45) Adding A entries for p1 and p2

```
$TTL    86400
@       IN      SOA     dns1.perf.netas. contact.netas. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      dns1
dns1    IN      A       192.168.0.1
p1      IN      A       10.0.3.1
p2      IN      A       10.0.3.2
```

46) Check on client1

```
┌──(root♦debian)-[~]
└─# host p1.perf.netas
p1.perf.netas has address 10.0.3.1
```

47) Share A between p1 and p2

```
$TTL    86400
@       IN      SOA     dns1.perf.netas. contact.netas. (
                              3_        ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                          86400 )       ; Negative Cache TTL
;
@       IN      NS      dns1
dns1    IN      A       192.168.0.1
p1      IN      A       10.0.3.1
p2      IN      A       10.0.3.2
scale   IN      A       10.0.3.1
scale   IN      A       10.0.3.2
```

48) Pinging scale.perf.netas on client1

The pinged IP does change randomly between the p1 and p2 IPs

49) Installing iperf on client1 and client2

```
┌──(root♦debian)-[~]
└─# apt install iperf
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances... Fait
Lecture des informations d'état... Fait
iperf est déjà la version la plus récente (2.0.14a+dfsg1-1).
0 mis à jour, 0 nouvellement installés, 0 à enlever et 0 non mis à jour.
```

50) Updating dns1 and dns2 so dns2 is a secondary server on the `perf.netas` zone

`named.conf.local` on `DNS2`

```
zone "netas" {
        type slave;
        file "/var/lib/bind/db.netas";
        masters { 192.168.0.1; };
};


zone "2.0.10.in-addr.arpa" {
        type slave;
        file "/var/lib/bind/db.netas-rev";
        masters { 192.168.0.1; };
};

zone "perf.netas" {
        type slave;
        file "/var/lib/bind/db.perf.netas";
        masters { 192.168.0.1; };
};
```

51) Ping from client2

```
┌──(root♦debian)-[~]
└─# ping scale.perf.netas
PING scale.perf.netas (10.0.3.1) 56(84) bytes of data.
64 bytes from 10.0.3.1 (10.0.3.1): icmp_seq=1 ttl=63 time=1.38 ms
64 bytes from 10.0.3.1 (10.0.3.1): icmp_seq=2 ttl=63 time=2.58 ms
^C
```

52) Speed test on client1 & client2

```
┌──(root♦debian)-[~]
└─# iperf -t 5 -c scale.perf.netas
------------------------------------------------------------
Client connecting to scale.perf.netas, TCP port 5001
TCP window size:  153 KByte (default)
------------------------------------------------------------
[  3] local 192.168.0.10 port 34190 connected with 10.0.3.2 port 5001
client await server close failed: Resource temporarily unavailable
[ ID] Interval       Transfer     Bandwidth
[  3] 0.0000-5.0249 sec   159 MBytes   266 Mbits/sec
```

53)