TP2 – Serveur Debian DS1: installation du service DNS

Sommaire

1 - Installation du paquetage BIND

→ On installe le paquet **bind9** :

```
root@DS1: ~#apt-get install bind9
```

→ On démarre le service :

```
root@DS1: ~#systemctl start bind9
```

→ On visualise les fichiers de configuration :

```
root@DS1: ~#ls -l /etc/bind/
total 48
-rw-r--r-- 1 root root 2403 27 juil.  2024 bind.keys
-rw-r--r-- 1 root root  255 27 juil.  2024 db.0
-rw-r--r-- 1 root root  271 27 juil.  2024 db.127
-rw-r--r-- 1 root root  237 27 juil.  2024 db.255
-rw-r--r-- 1 root root  353 27 juil.  2024 db.empty
-rw-r--r-- 1 root root  270 27 juil.  2024 db.local
-rw-r--r-- 1 root bind  458 27 juil.  2024 named.conf
-rw-r--r-- 1 root bind  498 27 juil.  2024 named.conf.default-zones
-rw-r--r-- 1 root bind  165 27 juil.  2024 named.conf.local
-rw-r--r-- 1 root bind  846 27 juil.  2024 named.conf.options
-rw-r----- 1 bind bind  100 29 janv. 09:07 rndc.key
-rw-r--r-- 1 root root 1317 27 juil.  2024 zones.rfc1918
```

→ On créé une **sauvegarde** de fichiers de configuration :

```
root@DS1: ~#cd /etc/bind
root@DS1: /etc/bind#cp named.conf names.conf.sauv
root@DS1: /etc/bind#cp named.conf.options names.conf.options.sauv
root@DS1: /etc/bind#cp named.conf.local named.conf.local.sauv
```

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→ On vérifie le **status** du service **bind** :

```
root@DS1: ~#systemctl status bind9
● named.service - BIND Domain Name Server
     Loaded: loaded (/lib/systemd/system/named.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-01-29 09:07:18 CET; 12min ago
       Docs: man:named(8)
   Main PID: 1014 (named)
     Status: "running"
      Tasks: 8 (limit: 2315)
     Memory: 44.7M
        CPU: 106ms
     CGroup: /system.slice/named.service
             └─1014 /usr/sbin/named -f -u bind
```

→ On renseigne le nom des **zones** et des **fichiers de zone** dans le fichier **/etc/bind/named.conf.local** :

```
  GNU nano 7.2                        /etc/bind/named.conf.local
//
// Do any local configuration here
//

// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
//les zones
zone "sio-exupery.local" IN {
        type master;
        file "db.sio-exupery.local";
        allow-update { none; };
};

zone "4.168.192.in-addr.arpa" IN {
        type master;
        file "rev.sio-exupery.local";
        allow-update { none; };
};
```

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→ On créé le fichier **/var/cache/bind/db.sio-exupery.local** pour la **zone de recherche** directe dans lequel on met les enregistrements correspondants aux machines :

```
  GNU nano 7.2                  /var/cache/bind/db.sio-exupery.local *
; Fichier pour la résolution directe
$TTL 86400
@ IN SOA DS1.sio-exupery.local. root.sio-exupery.local. (
        2024020401
        1w
        1d
        4w
        1w )
@ IN NS DS1.sio-exupery.local.
DS1 IN A 192.168.4.254
UD1 IN A 192.168.4.1_
```

→ On créé aussi le fichier **/var/cache/bind/rev.sio-exupery.local** pour la **résolution inversée** :

```
  GNU nano 7.2                  /var/cache/bind/rev.sio-exupery.local
; Fichier pour la résolution inverse
$TTL 86400
@ IN SOA DS1.sio-exupery.local. root.sio-exupery.local. (
        2024020401
        1w
        1d
        4w
        1w )
@ IN NS DS1.sio-exupery.local.
254 IN PTR DS1.sio-exupery.local.
1 IN PTR UD1.sio-exupery.local._
```

→ On attribue les 2 fichiers qu'on vient de créer au groupe **bind** :

```
root@DS1: ~#chgrp bind /var/cache/bind/*
root@DS1: ~#chmod 664 /var/cache/bind/*
root@DS1: ~#ls -l /var/cache/bind
total 16
-rw-rw-r-- 1 root bind  212 29 janv. 09:37 db.sio-exupery.local
-rw-r--r-- 1 bind bind 1421  5 févr. 09:12 managed-keys.bind
-rw-r--r-- 1 bind bind 1766  5 févr. 09:12 managed-keys.bind.jnl
-rw-rw-r-- 1 root bind  234 29 janv. 09:41 rev.sio-exupery.local
```

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→ On vérifie que **le répertoire** appartient bien au groupe :

```
root@DS1: ~#ls -ld /var/cache/bind
drwxrwxr-x 2 root bind 4096  5 févr. 09:12 /var/cache/bind
```

2 - Démarrage et tests du service

→ On modifie le fichier **/etc/hosts** pour renseigner la boucle locale et le nom FQDN du serveur :

```
  GNU nano 7.2
127.0.0.1       localhost.localdomain   localhost
192.168.4.254   DS1.sio-exupery.local   DS1

# The following lines are desirable for IPv6 capable hosts
::1     localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

→ On **désactive** les 2 cartes réseaux en tuant le processus puis on ajoute **dns-search, dns-domain** et **dns-nameservers** dans le fichier **/etc/network/interfaces** :

```
  GNU nano 7.2                                                /etc/network/interfaces *
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

source /etc/network/interfaces.d/*

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
allow-hotplug enp0s3
auto enp0s3
iface enp0s3 inet static
address 172.17.101.212
netmask 255.255.0.0
network 172.17.0.0
broadcast 172.17.255.255
gateway 172.17.250.2


allow-hotplug enp0s8
iface enp0s8 inet static
address 192.168.4.254
netmask 255.255.255.0
network 192.168.4.0
broadcast 192.168.4.255
dns-search sio-exupery.local
dns-domain sio-exupery.local
dns-nameservers 192.168.4.254
```

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→ On **réactive** les 2 cartes réseaux et on vérifie dans le fichier **/etc/resolv.conf** affich bien l'adresse IP du serveur DNS et la zone de recherche DNS :

```
root@DS1: ~#ifup enp0s3
root@DS1: ~#ifup enp0s8
```

```
  GNU nano 7.2                                                    /etc/resolv.conf
# Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#     DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
# 127.0.0.53 is the systemd-resolved stub resolver.
# run "resolvectl status" to see details about the actual nameservers.

nameserver 192.168.4.254
search sio-exupery.local
```

→ On change l'instruction **dnssec-validation auto** à **no** dans le fichier **/etc/bind/named.conf.options** :

```
  GNU nano 7.2                                          /etc/bind/named.conf.options
options {
        directory "/var/cache/bind";

        // If there is a firewall between you and nameservers you want
        // to talk to, you may need to fix the firewall to allow multiple
        // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

        // If your ISP provided one or more IP addresses for stable
        // nameservers, you probably want to use them as forwarders.
        // Uncomment the following block, and insert the addresses replacing
        // the all-0's placeholder.

        // forwarders {
        //      0.0.0.0;
        // };

        //========================================================================
        // If BIND logs error messages about the root key being expired,
        // you will need to update your keys.  See https://www.isc.org/bind-keys
        //========================================================================
        dnssec-validation no;

        listen-on-v6 { any; };
};
```

→ On relance le service **bind9** :

```
root@DS1: ~#systemctl restart bind9
```

→ On **vérifie** les fichiers **named.conf, db.sio-exupery.local et rev.sio-exupery.local** :

```
root@DS1: ~#cd /etc/bind
root@DS1: /etc/bind#named-checkconf
root@DS1: /etc/bind#cd /var/cache/bind
root@DS1: /var/cache/bind#named-checkzone -d sio-exupery.local db.sio-exupery.local
loading "sio-exupery.local" from "db.sio-exupery.local" class "IN"
zone sio-exupery.local/IN: loaded serial 2024020401
OK
root@DS1: /var/cache/bind#named-checkzone -d 4.168.192.in-addr.arpa rev.sio-exupery.local
loading "4.168.192.in-addr.arpa" from "rev.sio-exupery.local" class "IN"
zone 4.168.192.in-addr.arpa/IN: loaded serial 2024020401
OK
```

→ On regarde le **journal de base de systemd** en temps réel grâce à la commande **journalctl -f** pour effectuer le deuxième test de vérification sur une **deuxième console** :

```
root@DS1: ~#journalctl -f
févr. 09 19:00:55 DS1 named[813]: zone 4.168.192.in-addr.arpa/IN: loaded serial 2024020401
févr. 09 19:00:55 DS1 named[813]: zone localhost/IN: loaded serial 2
févr. 09 19:00:55 DS1 named[813]: all zones loaded
févr. 09 19:00:55 DS1 named[813]: running
févr. 09 19:00:55 DS1 systemd[1]: Started named.service - BIND Domain Name Server.
févr. 09 19:05:50 DS1 systemd[1]: Started getty@tty2.service - Getty on tty2.
févr. 09 19:05:55 DS1 login[828]: pam_unix(login:session): session opened for user root(uid=0) b
févr. 09 19:05:55 DS1 systemd-logind[439]: New session 3 of user root.
févr. 09 19:05:55 DS1 systemd[1]: Started session-3.scope - Session 3 of User root.
févr. 09 19:05:55 DS1 login[833]: ROOT LOGIN  on '/dev/tty2'
```

→ On relance le service **bind9** sur la **première console** :

```
root@DS1: ~#systemctl restart bind9
```

→ On observe sur la **deuxième console** si le service a bien démarré :

```
févr. 09 19:08:59 DS1 named[845]: managed-keys-zone: loaded serial 15
févr. 09 19:08:59 DS1 named[845]: zone 255.in-addr.arpa/IN: loaded serial 1
févr. 09 19:08:59 DS1 named[845]: zone 0.in-addr.arpa/IN: loaded serial 1
févr. 09 19:08:59 DS1 named[845]: zone sio-exupery.local/IN: loaded serial 2024020401
févr. 09 19:08:59 DS1 named[845]: zone 127.in-addr.arpa/IN: loaded serial 1
févr. 09 19:08:59 DS1 named[845]: zone localhost/IN: loaded serial 2
févr. 09 19:08:59 DS1 named[845]: zone 4.168.192.in-addr.arpa/IN: loaded serial 2024020401
févr. 09 19:08:59 DS1 named[845]: all zones loaded
févr. 09 19:08:59 DS1 systemd[1]: Started named.service - BIND Domain Name Server.
févr. 09 19:08:59 DS1 named[845]: running
```

***Tout a été chargé donc il n'y a pas d'erreurs.**

3 - Outils de test de résolution de noms

→ On vérifie la présence du paquetage **dnsutils** sur le système :

```
root@DS1: ~#dpkg -l | grep -i dnsutils
ii  bind9-dnsutils                1:9.18.28-1~deb12u2           amd64
Clients provided with BIND 9
```

→ On affiche les **informations** du domaine **UD1.sio-exupery.local** :

```
root@DS1: ~#dig UD1.sio-exupery.local

; <<>> DiG 9.18.28-1~deb12u2-Debian <<>> UD1.sio-exupery.local
;; global options: +cmd
;; Got answer:
;; WARNING: .local is reserved for Multicast DNS
;; You are currently testing what happens when an mDNS query is leaked to DNS
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 59639
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 6a51e954e32968a30100000067a8f1420d3b1653f8d2c025 (good)
;; QUESTION SECTION:
;UD1.sio-exupery.local.         IN      A

;; ANSWER SECTION:
UD1.sio-exupery.local.  86400   IN      A       192.168.4.1

;; Query time: 4 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)
;; WHEN: Sun Feb 09 19:17:38 CET 2025
;; MSG SIZE  rcvd: 94
```

→ On fait pareil avec le domaine **SOA sio-exupery.local** :

```
root@DS1: ~#dig SOA sio-exupery.local

; <<>> DiG 9.18.28-1~deb12u2-Debian <<>> SOA sio-exupery.local
;; global options: +cmd
;; Got answer:
;; WARNING: .local is reserved for Multicast DNS
;; You are currently testing what happens when an mDNS query is leaked to DNS
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 42562
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 77f9ff1035db64bd0100000067a8f182a9c81c04bf4f2e0a (good)
;; QUESTION SECTION:
;sio-exupery.local.             IN      SOA

;; ANSWER SECTION:
sio-exupery.local.      86400   IN      SOA     DS1.sio-exupery.local. root.sio-
exupery.local. 2024020401 604800 86400 2419200 604800

;; Query time: 0 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)
;; WHEN: Sun Feb 09 19:18:42 CET 2025
;; MSG SIZE  rcvd: 119
```

→ On affiche **le nom et l'adresse** de la machine **DS1** :

```
root@DS1: ~#nslookup DS1
Server:         192.168.4.254
Address:        192.168.4.254#53

Name:   DS1.sio-exupery.local
Address: 192.168.4.254
```

→ On affiche les informations du domaine **www.dunod.com** :

```
root@DS1: ~#dig www.dunod.com

; <<>> DiG 9.18.28-1~deb12u2-Debian <<>> www.dunod.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 40615
;; flags: qr rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;www.dunod.com.                 IN      A

;; ANSWER SECTION:
www.dunod.com.          2071    IN      A       51.144.190.143

;; Query time: 20 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Sun Feb 09 19:29:56 CET 2025
;; MSG SIZE  rcvd: 58
```

→ On affiche **l'adresse** du domaine **www.eni.fr** :

```
root@DS1: ~#nslookup www.eni.fr
Server:         8.8.8.8
Address:        8.8.8.8#53

Non-authoritative answer:
www.eni.fr      canonical name = ip200.eni.fr.
Name:   ip200.eni.fr
Address: 185.42.28.200
```

→ On vérifie la **résolution DNS interne** en effectuant des **tests ping** :

```
root@DS1: ~#ping -c 2 DS1
PING DS1.sio-exupery.local (192.168.4.254) 56(84) bytes of data.
64 bytes from DS1.sio-exupery.local (192.168.4.254): icmp_seq=1 ttl=64 time=0.040 ms
64 bytes from DS1.sio-exupery.local (192.168.4.254): icmp_seq=2 ttl=64 time=0.041 ms

--- DS1.sio-exupery.local ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1083ms
rtt min/avg/max/mdev = 0.040/0.040/0.041/0.000 ms
root@DS1: ~#ping -c 2 UD1
PING UD1.sio-exupery.local (192.168.1.81) 56(84) bytes of data.
64 bytes from UD1.sio-exupery.local (192.168.1.81): icmp_seq=1 ttl=64 time=0.248 ms
64 bytes from UD1.sio-exupery.local (192.168.1.81): icmp_seq=2 ttl=64 time=0.238 ms

--- UD1.sio-exupery.local ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1016ms
rtt min/avg/max/mdev = 0.238/0.243/0.248/0.005 ms
root@DS1: ~#ping -c 2 www.ac-nice.fr
PING www.ac-nice.fr.cdn.cloudflare.net (141.101.90.105) 56(84) bytes of data.
64 bytes from 141.101.90.105 (141.101.90.105): icmp_seq=1 ttl=56 time=6.60 ms
64 bytes from 141.101.90.105 (141.101.90.105): icmp_seq=2 ttl=56 time=7.50 ms

--- www.ac-nice.fr.cdn.cloudflare.net ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1008ms
rtt min/avg/max/mdev = 6.595/7.048/7.501/0.453 ms
```

4 - S'appuyer sur un DNS externe : la redirection

→ On commente les lignes du fichier **names.conf.default-zones** qui sont liées aux **serveurs racines** :

```
  GNU nano 7.2                                                    /etc/b
// prime the server with knowledge of the root servers
//zone "." {
//       type hint;
//       file "/usr/share/dns/root.hints";
//};
```

→ On décommente l'instruction **forwarders** dans le fichier **named.conf.options** et on la modifie :

```
  GNU nano 7.2                                    /etc/bind/named.conf.options
options {
        directory "/var/cache/bind";

        // If there is a firewall between you and nameservers you want
        // to talk to, you may need to fix the firewall to allow multiple
        // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

        // If your ISP provided one or more IP addresses for stable
        // nameservers, you probably want to use them as forwarders.
        // Uncomment the following block, and insert the addresses replacing
        // the all-0's placeholder.

           forward only;
           forwarders { 8.8.8.8; };
           allow-recursion { localnets; };

        //========================================================================
        // If BIND logs error messages about the root key being expired,
        // you will need to update your keys.  See https://www.isc.org/bind-keys
        //========================================================================
        dnssec-validation no;

        listen-on-v6 { any; };
};
```

→ On relance et on vérifie le status du service **bind9** :

```
root@DS1: ~#systemctl restart bind9
root@DS1: ~#systemctl status bind9
• named.service - BIND Domain Name Server
     Loaded: loaded (/lib/systemd/system/named.service; enabled; preset: enabled)
     Active: active (running) since Sun 2025-02-09 20:44:37 CET; 5s ago
       Docs: man:named(8)
   Main PID: 875 (named)
     Status: "running"
      Tasks: 6 (limit: 2315)
     Memory: 30.5M
        CPU: 21ms
     CGroup: /system.slice/named.service
             └─875 /usr/sbin/named -f -u bind

févr. 09 20:44:37 DS1 named[875]: managed-keys-zone: loaded serial 15
févr. 09 20:44:37 DS1 named[875]: zone 0.in-addr.arpa/IN: loaded serial 1
févr. 09 20:44:37 DS1 named[875]: zone 255.in-addr.arpa/IN: loaded serial 1
févr. 09 20:44:37 DS1 named[875]: zone sio-exupery.local/IN: loaded serial 2024020401
févr. 09 20:44:37 DS1 named[875]: zone 127.in-addr.arpa/IN: loaded serial 1
févr. 09 20:44:37 DS1 named[875]: zone 4.168.192.in-addr.arpa/IN: loaded serial 2024020401
févr. 09 20:44:37 DS1 named[875]: zone localhost/IN: loaded serial 2
févr. 09 20:44:37 DS1 named[875]: all zones loaded
févr. 09 20:44:37 DS1 named[875]: running
févr. 09 20:44:37 DS1 systemd[1]: Started named.service - BIND Domain Name Server.
```

→ On teste à nouveau une **résolution DSN externe** pour voir sa **rapidité** :

```
root@DS1: ~#dig www.ac-nice.fr

; <<>> DiG 9.18.28-1~deb12u2-Debian <<>> www.ac-nice.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 2773
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;www.ac-nice.fr.                        IN      A

;; ANSWER SECTION:
www.ac-nice.fr.         2237    IN      CNAME   www.ac-nice.fr.cdn.cloudflare.net.
www.ac-nice.fr.cdn.cloudflare.net. 300 IN A     141.101.90.104
www.ac-nice.fr.cdn.cloudflare.net. 300 IN A     141.101.90.105
www.ac-nice.fr.cdn.cloudflare.net. 300 IN A     141.101.90.106
www.ac-nice.fr.cdn.cloudflare.net. 300 IN A     141.101.90.107

;; Query time: 28 msec
;; SERVER: 8.8.8.8#53(8.8.8.8) (UDP)
;; WHEN: Sun Feb 09 20:45:45 CET 2025
;; MSG SIZE  rcvd: 154
```

5 – Test à partir du client Ubuntu

→ On lance la machine **UD1** puis on vérifie le nom de la machine dans le fichier **hostname** :

```
  GNU nano 7.2                                    /etc/hostname
UD1
```

→ On modifie son **IP**, son **nom** et son **FQDN** dans le fichier **hosts** puis on redémarre la machine :

```
  GNU nano 7.2                                        /etc/hosts
127.0.0.1 localhost
192.168.1.81 UD1.sio-exupery.local UD1
```

```
ud1@UD1:~$ reboot
```

→ On modifie la **configuration IP** sans passer par l'interface graphique en modifiant le fichier **network-manager-all.yaml** :

```
  GNU nano 7.2              /etc/netplan/01-network-manager-all.yaml
# Let NetworkManager manage all devices on this system
network:
  version: 2
  renderer: networkd
  ethernets:
    enp0s3:
      dhcp4: no
      dhcp6: no
      addresses: [192.168.1.81/24]
      gateway4: 192.168.1.254
      nameservers:
      search: [sio-exupery.local]
      addresses: [192.168.1.254]
```

→ On génère le fichier **.network** puis on redémarre le service **systemd-networkd** avec la commande **sudo netplan apply** :

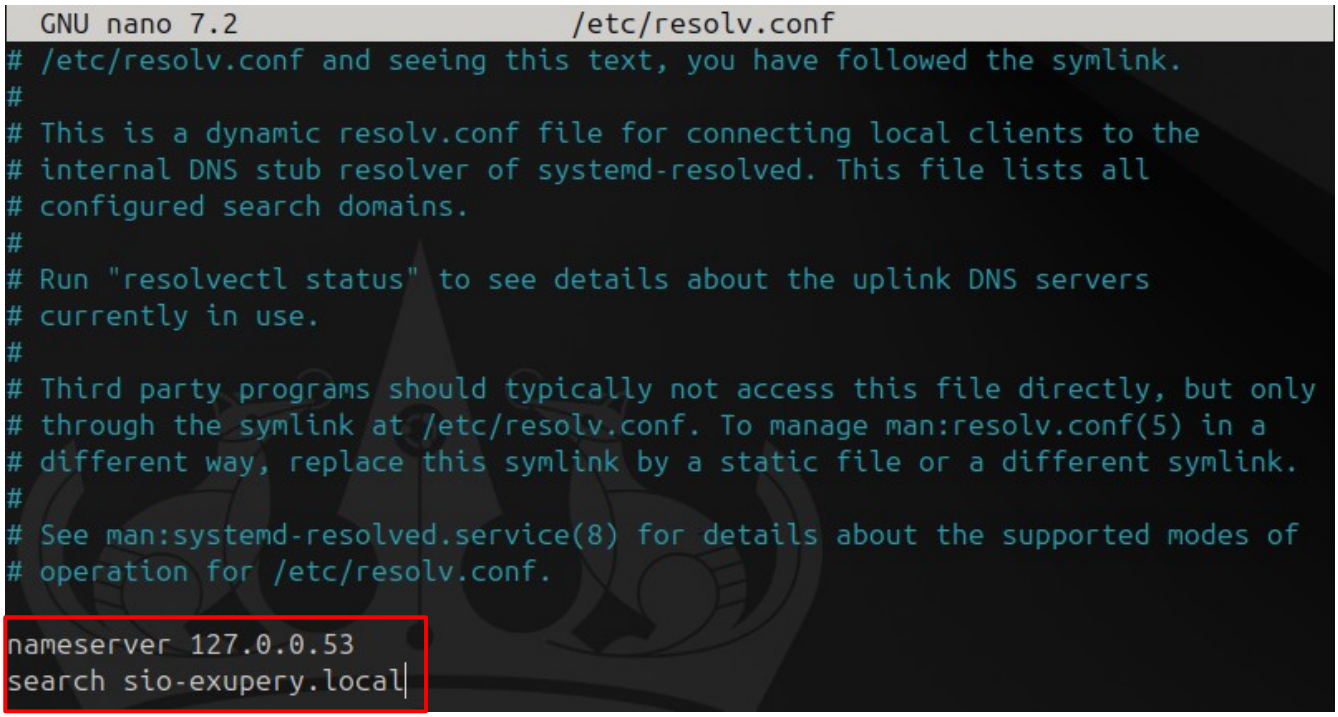
```
ud1@UD1:~$ sudo netplan apply
```

→ On vérifie que la **configuration IP** ait bien été appliquée :

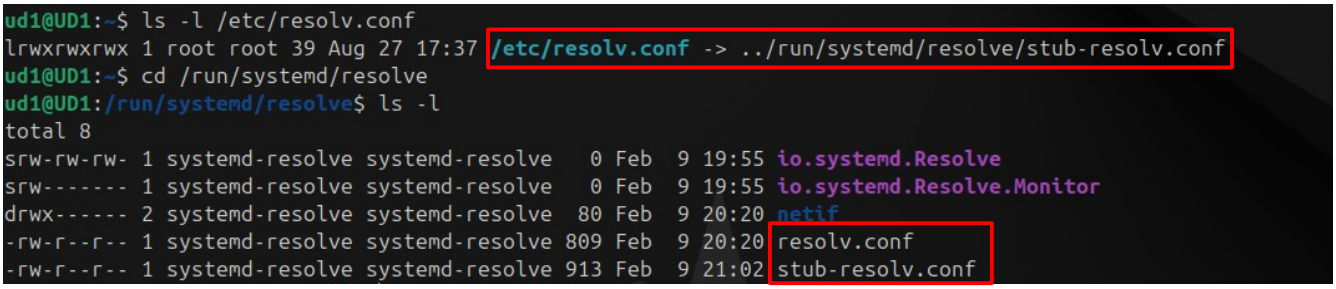
```
ud1@UD1:~$ ip -c a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group defaul
t qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
       valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
group default qlen 1000
    link/ether 08:00:27:e0:f9:e0 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.81/24 brd 192.168.1.255 scope global noprefixroute enp0s3
       valid_lft forever preferred_lft forever
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP
group default qlen 1000
    link/ether 08:00:27:52:98:9b brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.180/24 brd 192.168.1.255 scope global dynamic noprefixroute e
np0s8
       valid_lft 82642sec preferred_lft 82642sec
    inet6 fe80::55f8:31f2:2c87:86e6/64 scope link noprefixroute
       valid_lft forever preferred_lft forever
```

```
ud1@UD1:~$ ip r
default via 192.168.1.254 dev enp0s8 proto dhcp src 192.168.1.180 metric 100
default via 192.168.1.254 dev enp0s3 proto static metric 20101
192.168.1.0/24 dev enp0s8 proto kernel scope link src 192.168.1.180 metric 100
192.168.1.0/24 dev enp0s3 proto kernel scope link src 192.168.1.81 metric 101
```

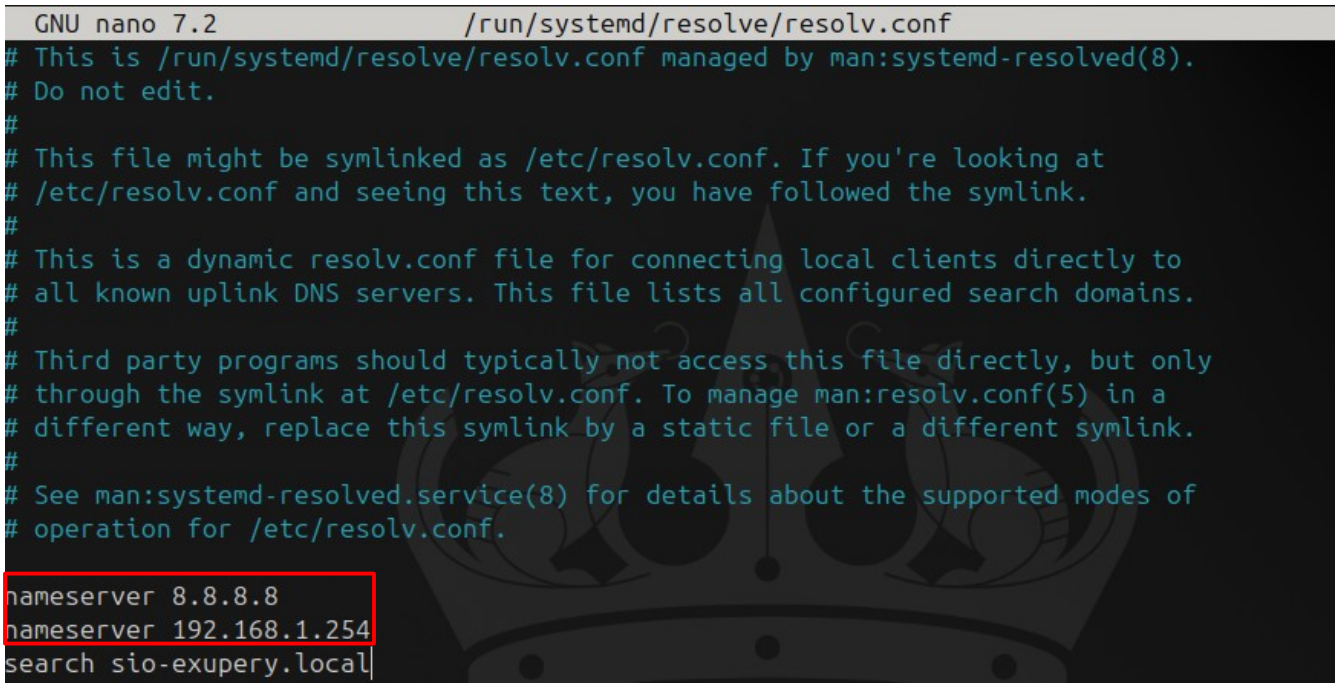
→ On remarque que le fichier **/etc/resolv.conf** ne mentionne pas l'adresse du **serveur DNS DS1** :



→ On remarque que c'est dû au fait que ce fichier est uniquement un **lien symbolique** pointant vers le fichier **/run/systemd/resolve/stub-resolv.conf** :



→ On affiche le contenu du fichier **/run/systemd/resolve/resolv.conf** pour vérifier que **l'adresse du serveur DNS** s'y trouve bien :



→ On saisit les commandes **dig SOA sio-exupery.local, dig DS1.sio-exupery.local et dig www.eni.fr** à la chaîne pour vérifier le bon fonctionnement du **DNS** :

```
ud1@UD1:~$ dig DS1.sio-exupery.local

; <<>> DiG 9.18.28-0ubuntu0.24.04.1-Ubuntu <<>> DS1.sio-exupery.local
;; global options: +cmd
;; Got answer:
;; WARNING: .local is reserved for Multicast DNS
;; You are currently testing what happens when an mDNS query is leaked to DNS
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 28537
;; flags: qr aa rd ra ad; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;DS1.sio-exupery.local.         IN      A

;; ANSWER SECTION:
DS1.sio-exupery.local.  0       IN      A       192.168.1.80

;; Query time: 0 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Sun Feb 09 21:23:36 CET 2025
;; MSG SIZE  rcvd: 66
```

```
ud1@UD1:~$ dig www.eni.fr

; <<>> DiG 9.18.28-0ubuntu0.24.04.1-Ubuntu <<>> www.eni.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 42818
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;www.eni.fr.                    IN      A

;; ANSWER SECTION:
www.eni.fr.             465     IN      CNAME   ip200.eni.fr.
ip200.eni.fr.           465     IN      A       185.42.28.200

;; Query time: 8 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Sun Feb 09 21:24:14 CET 2025
;; MSG SIZE  rcvd: 75
```

→ On saisit la commande **nslookup www.editions-eyrolles.com** :

```
ud1@UD1:~$ nslookup www.editions-eyrolles.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
www.editions-eyrolles.com       canonical name = app943253.prod.cudawaas.com.
app943253.prod.cudawaas.com     canonical name = waas-prod-app-a978c6906656d1f69447ac81
ef5f29ee.trafficmanager.net.
waas-prod-app-a978c6906656d1f69447ac81ef5f29ee.trafficmanager.net       canonical name
= waasprod-app-53c57dcd5270778795e5d53a512d0297.francecentral.cloudapp.azure.com.
Name:   waasprod-app-53c57dcd5270778795e5d53a512d0297.francecentral.cloudapp.azure.com
Address: 4.176.6.76
```

→ On **ping DS1** :

```
ud1@UD1:~$ ping -c 2 DS1
PING DS1.sio-exupery.local (192.168.1.80) 56(84) bytes of data.
64 bytes from DS1.sio-exupery.local (192.168.1.80): icmp_seq=1 ttl=64 time=0.265 ms
64 bytes from DS1.sio-exupery.local (192.168.1.80): icmp_seq=2 ttl=64 time=0.246 ms

--- DS1.sio-exupery.local ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1044ms
rtt min/avg/max/mdev = 0.246/0.255/0.265/0.009 ms
```

→ On vérifie **l'accès à Internet** en affichant le site de l'académie de Nice :