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1. Installation du nouveau service DNS sur DS2

Depuis DS2 j'installe le paquet **bind9**

```
root@DS2: ~#apt-get install bind9
Lecture des listes de paquets... Fait
Construction de l'arbre des dépendances... Fait
Lecture des informations d'état... Fait
Les paquets supplémentaires suivants seront installés :
  bind9-utils dns-root-data
Paquets suggérés :
  bind9-doc ufw
Les NOUVEAUX paquets suivants seront installés :
  bind9 bind9-utils dns-root-data
0 mis à jour, 3 nouvellement installés, 0 à enlever et 4 non mis à jour.
Il est nécessaire de prendre 445 kB dans les archives.
Après cette opération, 1 673 ko d'espace disque supplémentaires seront utilisés.
Souhaitez-vous continuer ? [O/n] 0
```

Dans le fichier **named.conf.local** je renseigne les zones

```
GNU nano 8.4 /etc/bind/named.conf.local
//
// Do any local configuration here
//
// Consider adding the 1918 zone here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
//les zones
zone "sio-exupery.fr" IN {
    type master;
    file "db.sio-exupery.fr";
    allow-update { none; };
};
zone "4.168.192.in-addr.arpa" IN {
    type master;
    file "rev.sio-exupery.fr";
    allow-update { none; };
};
```

A l'aide de la commande **touch** je créer le fichier **db.sio-exupery.fr** et je renseigne les zones

```
GNU nano 8.4 /var/cache/bind/db.sio-exupery.fr
; Fichier pour la résolution directe
$TTL 86400
@      IN SOA  DS2.sio-exupery.fr. root.sio-exupery.fr. (
        0503202601
        1w
        1d
        4w
        1w)
@      IN NS   DS2.sio-exupery.fr.
intra.sio-exupery.fr. IN NS   DS1.intra.sio-exupery.fr.
DS2.sio-exupery.fr.  IN A    192.168.4.10
DS1.intra.sio-exupery.fr. IN A  192.168.4.254
ftp    IN      CNAME  DS2
www    IN      CNAME  DS2
```

Je créer également le fichier qui se nomme **rev.sio-exupery.fr** je renseigne le type d'enregistrement de type NS

```
GNU nano 8.4 rev.sio-exupery.fr
; Fichier pour la résolution inverse
$TTL 86400
@      IN SOA  DS2.sio-exupery.fr. root.sio-exupery.fr. (
        0503202601
        1w
        1d
        4w
        1w )
@      IN NS  DS2.sio-exupery.fr.
10     IN PTR  DS2.sio-exupery.fr.
```

J'attribue les 2 fichiers au groupe **bind**

```
root@DS2: ~#chgrp bind /var/cache/bind/*
root@DS2: ~#chmod 664 /var/cache/bind/*
root@DS2: ~#ls -l /var/cache/bind
total 16
-rw-rw-r-- 1 root bind 346  5 mars 16:23 db.sio-exupery.fr
-rw-rw-r-- 1 bind bind 287  5 mars 16:05 managed-keys.bind
-rw-rw-r-- 1 bind bind 785  5 mars 16:05 managed-keys.bind.jnl
-rw-rw-r-- 1 root bind 198  5 mars 16:33 rev.sio-exupery.fr
root@DS2: ~#
```

Je mets à jour le fichier hosts

```
GNU nano 8.4 /etc/hosts
127.0.0.1 localhost
192.168.4.10 DS2.sio-exupery.fr DS2
# The following lines are desirable for IPv6 capable hosts
::1 localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

Je mets à jour le fichier interfaces

```
GNU nano 8.4 /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
iface enp0s3 inet static
address 192.168.4.10
netmask 255.255.255.0
network 192.168.4.0
broadcast 192.168.4.255
gateway 192.168.4.254
dns-search sio-exupery.fr
dns-domain sio-exupery.fr
dns-nameservers 192.168.4.10
# This is an autoconfigured IPv6 interface
iface enp0s3 inet6 auto
```

Je redémarre le service DNS

```
root@DS2: ~#systemctl restart bind9
root@DS2: ~#_
```

A l'aide de la commande **cat** j'affiche le contenu du fichier **resolv.conf**

```
root@DS2: ~#cat /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
nameserver 192.168.4.10
search sio-exupery.fr
root@DS2: ~#
```

Je commente les lignes qui concernent les serveurs racines dans le fichier **named.conf.root-hints**

```
GNU nano 8.4 /etc/bind/named.conf.root-hints
// prime the server with knowledge of the root servers
//zone "." {
//     type hint;
//     file "/usr/share/dns/root.hints";
//};
```

Je modifie le fichier **named.conf.options**

```
GNU nano 8.4 /etc/bind/named.conf.options
options {
    directory "/var/cache/bind";
    forward only;
    forwarders { 172.17.254.1; };
    dnssec-validation no;
    listen-on-v6 { any; };
};
```

je relance le service DNS et je teste la résolution DNS depuis DS2

```
root@DS2: ~#systemctl restart bind9
root@DS2: ~#dig SOA sio-exupery.fr

;<<> DiG 9.20.18-1~deb13u1-Debian <<> SOA sio-exupery.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 17387
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 1bf744a1481273040100000069a9a512464122eba197a744 (good)
;; QUESTION SECTION:
;sio-exupery.fr.                IN      SOA

;; ANSWER SECTION:
sio-exupery.fr.                86400  IN      SOA      DS2.sio-exupery.fr. root.sio-exupery.fr. 503202601 604800 86400 2419200 604800

;; Query time: 4 msec
;; SERVER: 192.168.4.10#53(192.168.4.10) (UDP)
;; WHEN: Thu Mar 05 16:45:22 CET 2026
;; MSG SIZE rcvd: 116
```

```
root@DS2: ~#dig DS2.sio-exupery.fr

;<<> DiG 9.20.18-1~deb13u1-Debian <<> DS2.sio-exupery.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 37885
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: cd9e59b07ce4adc50100000069b2cf0b315e9ec44bd55156 (good)
;; QUESTION SECTION:
;DS2.sio-exupery.fr.          IN      A

;; ANSWER SECTION:
DS2.sio-exupery.fr.          86400  IN      A        192.168.4.10

;; Query time: 0 msec
;; SERVER: 192.168.4.10#53(192.168.4.10) (UDP)
;; WHEN: Thu Mar 12 15:34:51 CET 2026
;; MSG SIZE rcvd: 91
```

```

root@DS2: ~#dig DS1.intra.sio-exupery.fr

;<<> DiG 9.20.18-1~deb13u1-Debian <<> DS1.intra.sio-exupery.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 57021
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: d08716cb7c8b3d6d0100000069b2d262c6ed1fec489d4e5d (good)
;; QUESTION SECTION:
;DS1.intra.sio-exupery.fr.      IN      A

;; ANSWER SECTION:
DS1.intra.sio-exupery.fr. 86400 IN      A      192.168.4.254

;; Query time: 0 msec
;; SERVER: 192.168.4.10#53(192.168.4.10) (UDP)
;; WHEN: Thu Mar 12 15:49:06 CET 2026
;; MSG SIZE rcvd: 97

```

```

root@DS2: ~#dig www.ac-nice.fr

;<<> DiG 9.20.18-1~deb13u1-Debian <<> www.ac-nice.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 23005
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 8a98a451662a19550100000069b2d29a1ee1c35600f08cf6 (good)
;; QUESTION SECTION:
;www.ac-nice.fr.              IN      A

;; ANSWER SECTION:
www.ac-nice.fr.              2547   IN      CNAME   www.ac-nice.fr.cdn.cloudflare.net.
www.ac-nice.fr.cdn.cloudflare.net. 218 IN A     141.101.90.104
www.ac-nice.fr.cdn.cloudflare.net. 218 IN A     141.101.90.107
www.ac-nice.fr.cdn.cloudflare.net. 218 IN A     141.101.90.106
www.ac-nice.fr.cdn.cloudflare.net. 218 IN A     141.101.90.105

;; Query time: 4 msec
;; SERVER: 192.168.4.10#53(192.168.4.10) (UDP)
;; WHEN: Thu Mar 12 15:50:02 CET 2026
;; MSG SIZE rcvd: 182

```

2. Transformation du DNS sur le serveur DS1

Sur DS1 je modifie les zones

```
GNU nano 8.4 /etc/bind/named.conf.local
// Do any local configuration here
//
zone "intra.sio-exupery.fr" IN {
    type master;
    file "db.intra.sio-exupery.fr";
    allow-update { key "rndc-key"; };
};
zone "4.168.192.in-addr.arpa" IN {
    type master;
    file "rev.intra.sio-exupery.fr";
    allow-update { key rndc-key ; };
};
```

Je vérifie que DS1 soit serveur ssh

```
root@DS1: ~#dpkg -l | grep -i ssh
ii  openssh-client      1:10.0p1-7          amd64      secure shell (SSH)
ii  openssh-server     1:10.0p1-7          amd64      secure shell (SSH)
ii  openssh-sftp-server 1:10.0p1-7          amd64      secure shell (SSH)
ines
root@DS1: ~#_
```

Je vérifie également que le fichier sshd_config autorise l'accès SSH à l'utilisateur root

```
GNU nano 8.4 /etc/ssh/sshd_config
# This is the sshd server system-wide configuration file. See
# sshd_config(5) for more information.

# This sshd was compiled with PATH=/usr/local/bin:/usr/bin:/bin:/usr/games

# The strategy used for options in the default sshd_config shipped with
# OpenSSH is to specify options with their default value where
# possible, but leave them commented. Uncommented options override the
# default value.

Include /etc/ssh/sshd_config.d/*.conf

#Port 22
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key

# Ciphers and keying
#RekeyLimit default none

# Logging
#SyslogFacility AUTH
#LogLevel INFO

# Authentication:
#LoginGraceTime 2m
PermitRootLogin yes
#StrictModes yes
```

Je relance le service sshd

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

Depuis DS2 je copie le fichier qui se nomme db.sio-exupery.fr vers DS1

```
root@DS2: ~#scp /var/cache/bind/db.sio-exupery.fr root@192.168.4.254:/var/cache/bind/
The authenticity of host '192.168.4.254 (192.168.4.254)' can't be established.
ED25519 key fingerprint is SHA256:7HuPWvq22ZX+pKFMAdhy3cL7cdhaF+ccNa15e0sRQ78.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.4.254' (ED25519) to the list of known hosts.
root@192.168.4.254's password:
db.sio-exupery.fr
root@DS2: ~#_
```

Depuis DS1 je modifie le fichier copié **db.sio-exupery.fr** et au moment de l'enregistrer je le nomme **db.intra.sio-exupery.fr**

```
GNU nano 8.4 /var/cache/bind/db.intra.sio-exupery.fr
; Fichier pour la résolution directe
$TTL 86400
@      IN SOA  DS1.intra.sio-exupery.fr. root.intra.sio-exupery.fr. (
        0503202601
        1w
        1d
        4w
        1w)
DS1.intra.sio-exupery.fr.      IN NS   DS1.intra.sio-exupery.fr.
                              IN A    192.168.4.254
```

Je fais la même chose avec le fichier **rev.sio-exupery.fr**

```
root@DS2: ~# scp /var/cache/bind/rev.sio-exupery.fr root@192.168.4.254:/var/cache/bind/
root@192.168.4.254's password:
rev.sio-exupery.fr
100% 198 156.4KB/s 00:00
root@DS2: ~#
```

Depuis DS1 je modifie le fichier que j'ai copié

```
GNU nano 8.4 /var/cache/bind/rev.intra.sio-exupery.fr
; Fichier pour la résolution inverse
$TTL 86400
@      IN SOA  DS1.intra.sio-exupery.fr. root.intra.sio-exupery.fr. (
        0503202601
        1w
        1d
        4w
        1w )
@      IN NS   DS1.intra.sio-exupery.fr.
254    IN PTR  DS1.intra.sio-exupery.fr.
```

J'attribue les deux fichiers dans le même groupe

```
root@DS1: ~# chgrp bind /var/cache/bind/*
root@DS1: ~# chmod 664 /var/cache/bind/*
root@DS1: ~# _
```

Je modifie le fichier **hosts** pour spécifier **DS1.intra.sio-exupery.fr**

```
GNU nano 8.4 /etc/hosts *
127.0.0.1 localhost.localdomain localhost
192.168.4.254 DS1.intra.sio-exupery.fr_ DS1

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

Je modifie le fichier interfaces pour faire prendre en compte les modifications

```
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 intra.sio-exupery.fr
dns-domain intra.sio-exupery.fr
dns-nameservers 192.168.4.254
```

Je vérifie le contenu du fichier resolv.conf

```
root@DS1: ~# ifup enp0s8
root@DS1: ~# cat /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
nameserver 192.168.4.254
search intra.sio-exupery.fr
root@DS1: ~#
```

Je modifie le fichier named.conf.options pour rediriger les requêtes DNS vers le serveur DNS de DS2

```
GNU nano 8.4 /etc/bind/named.conf.options
options {
    directory "/var/cache/bind";
    forward only;
    forwarders { 192.168.4.10; };
    allow-recursion { localnets; };
    allow-query { any; };
    dnssec-validation no;
};
```

Je remplace le fichier sio-exupery.fr par intrasio-exupery.fr dans le fichier de configuration DHCP.conf

```
GNU nano 8.4 /etc/dhcp/dhcpd.conf *
# dhcpd.conf
#
# Sample configuration file for ISC dhcpd
#
# option definitions common to all supported networks...
option domain-name "intra.sio-exupery.fr";
option domain-name-servers 192.168.4.254;
default-lease-time 86400;
max-lease-time 604800;
```

```
subnet 192.168.4.0 netmask 255.255.255.0 {
    range 192.168.4.11 192.168.4.100;
    option routers 192.168.4.254;
    option subnet-mask 255.255.255.0;
}
ddns-domainname "intra.sio-exupery.fr";
ddns-rev-domainname "in-addr.arpa";
}
```

```
include "/etc/dhcp/rndc.key";
# Zones DNS à mettre à jour
zone intra.sio-exupery.fr. {
    primary 127.0.0.1;
    key rndc-key;
}
zone 4.168.192.in-addr.arpa. {
    primary 127.0.0.1;
    key rndc-key;
}
```

Je test la résolution DNS depuis DS1

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

;<><> DiG 9.20.15-1~deb13ui-Debian <>> SOA intra.sio-exupery.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 31746
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 1232
;; COOKIE: 38df2ff39c05c05f010000069b2dd97cae71ab44624eb20 (good)
;; QUESTION SECTION:
;intra.sio-exupery.fr.          IN      SOA
;; ANSWER SECTION:
intra.sio-exupery.fr.  86400  IN      SOA      DS1.intra.sio-exupery.fr. root.intra.sio-exupery.fr. 503202601 604800 86400

;; Query time: 0 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)
;; WHEN: Thu Mar 12 16:36:55 CET 2026
;; MSG SIZE rcvd: 122

root@DS1: ~#
```

Je démarre la machine DD1

```
root@DS1: ~#journalctl -f
mars 18 20:01:51 DS1 dhcpd[1246]: Copyright 2004-2022 Internet Systems Consortium.
mars 18 20:01:51 DS1 dhcpd[1246]: All rights reserved.
mars 18 20:01:51 DS1 kernel: audit: type=1400 audit(1773860511.369:117): apparmor="DENIED" operation="open" class="file" profile="/usr/sbin/dhcpd" name="/proc/sys/net/ipv4/ip_local_port_range" pid=1246 comm="dhcpd" requested_mask="r" denied_mask="r" fsuid=0 ouid=0
mars 18 20:01:51 DS1 kernel: audit: type=1400 audit(1773860511.369:118): apparmor="DENIED" operation="open" class="file" profile="/usr/sbin/dhcpd" name="/proc/sys/net/ipv4/ip_local_port_range" pid=1246 comm="dhcpd" requested_mask="r" denied_mask="r" fsuid=0 ouid=0
mars 18 20:01:51 DS1 dhcpd[1246]: For info, please visit https://www.isc.org/software/dhcp/
mars 18 20:01:51 DS1 dhcpd[1246]: Wrote 0 leases to leases file.
mars 18 20:01:51 DS1 dhcpd[1246]: Server starting service.
mars 18 20:01:51 DS1 kernel: audit: type=1400 audit(1773860511.393:119): apparmor="DENIED" operation="capable" class="cap" profile="/usr/sbin/dhcpd" pid=1246 comm="dhcpd" capability=21 capname="sys_admin"
mars 18 20:01:53 DS1 isc-dhcp-server[1234]: Starting ISC DHCPv4 server: dhcpd.
mars 18 20:01:53 DS1 systemd[1]: Started isc-dhcp-server.service - LSB: DHCP server.
mars 18 20:02:52 DS1 dhcpd[1246]: DHCPREQUEST for 192.168.4.11 from 08:00:27:97:81:68 via enp0s8
mars 18 20:02:52 DS1 dhcpd[1246]: DHCPACK on 192.168.4.11 to 08:00:27:97:81:68 (DD1) via enp0s8
mars 18 20:02:52 DS1 named[969]: client 0x7f3b9426b400 127.0.0.1#44943/key rndc-key: signer "rndc-key" approved
mars 18 20:02:52 DS1 named[969]: client 0x7f3b9426b400 127.0.0.1#44943/key rndc-key: updating zone 'intra.sio-exupery.fr/IN': adding an RR at 'DD1.intra.sio-exupery.fr' A 192.168.4.11
mars 18 20:02:52 DS1 named[969]: client 0x7f3b9426b400 127.0.0.1#44943/key rndc-key: updating zone 'intra.sio-exupery.fr/IN': adding an RR at 'DD1.intra.sio-exupery.fr' TXT "31122ba538e7aa474dc7a12fb5ea643c57"
mars 18 20:02:52 DS1 dhcpd[1246]: Added new forward map from DD1.intra.sio-exupery.fr to 192.168.4.11
mars 18 20:02:52 DS1 named[969]: client 0x7f3b9426b400 127.0.0.1#44943/key rndc-key: signer "rndc-key" approved
mars 18 20:02:52 DS1 named[969]: client 0x7f3b9426b400 127.0.0.1#44943/key rndc-key: updating zone '4.168.192.in-addr.arpa/IN': deleting rrsset at '11.4.168.192.in-addr.arpa' PTR
mars 18 20:02:52 DS1 named[969]: client 0x7f3b9426b400 127.0.0.1#44943/key rndc-key: updating zone '4.168.192.in-addr.arpa/IN': adding an RR at '11.4.168.192.in-addr.arpa' PTR DD1.intra.sio-exupery.fr.
mars 18 20:02:52 DS1 dhcpd[1246]: Added reverse map from 11.4.168.192.in-addr.arpa to DD1.intra.sio-exupery.fr
```

Je vérifie les fichiers de l'inscription du DNS

```
root@DS1: ~#ls -l /var/cache/bind
total 60
-rw-rw-r-- 1 root bind 230 12 mars 16:10 db.intra.sio-exupery.fr
-rw-r--r-- 1 bind bind 865 18 mars 20:02 db.intra.sio-exupery.fr.jnl
-rw-rw-r-- 1 root bind 345 12 mars 16:02 db.sio-exupery.fr
-rw-rw-r-- 1 bind bind 325 5 mars 16:13 db.sio-exupery.local
-rw-rw-r-- 1 bind bind 3134 5 mars 16:01 db.sio-exupery.local.jnl
-rw-rw-r-- 1 bind bind 1411 15 janv. 16:08 managed-keys.bind
-rw-rw-r-- 1 bind bind 3020 15 janv. 16:08 managed-keys.bind.jnl
-rw-rw-r-- 1 root bind 223 12 mars 16:16 rev.intra.sio-exupery.fr
-rw-r--r-- 1 bind bind 817 18 mars 20:02 rev.intra.sio-exupery.fr.jnl
-rw-rw-r-- 1 root bind 198 12 mars 16:11 rev.sio-exupery.fr
-rw-rw-r-- 1 bind bind 414 5 mars 16:16 rev.sio-exupery.local
-rw-rw-r-- 1 bind bind 2252 5 mars 16:01 rev.sio-exupery.local.jnl
-rw-rw-r-- 1 bind bind 1411 15 janv. 14:59 tmp-3g8ALnTqQ
-rw-rw-r-- 1 bind bind 0 5 févr. 15:06 tmp-8GCzW9u8QR
-rw-rw-r-- 1 bind bind 0 15 janv. 15:09 tmp-BUBw2d5iRj
-rw-rw-r-- 1 bind bind 1411 15 janv. 15:54 tmp-glfMEmbKbf
-rw-rw-r-- 1 bind bind 1411 14 janv. 23:13 tmp-qjp8FEuqXl
root@DS1: ~#
```

Je test la résolution DNS

```
root@DS1: ~#dig SOA sio-exupery.fr
;<<> DiG 9.20.15-1~deb13u1-Debian <<> SOA sio-exupery.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 65312
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 1232
;; COOKIE: 90863a4ed5a3e43a010000069baf8e554d8f250f735e9fa (good)
;; QUESTION SECTION:
;sio-exupery.fr.                IN      SOA

;; ANSWER SECTION:
sio-exupery.fr.                86400  IN     SOA    DS2.sio-exupery.fr. root.sio-exupery.fr. 503202601 604800 86400 2419200 604800

;; Query time: 0 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)
;; WHEN: Wed Mar 18 20:11:33 CET 2026
;; MSG SIZE rcvd: 116
root@DS1: ~#
```

```
root@DS1: ~#dig www.ac-nice.fr
; <>> DiG 9.20.15-1~deb13u1-Debian <>> www.ac-nice.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 31737
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 98dfbc356d9a52ff0100000069baf95bd4c57f788f3d9cd2 (good)
;; QUESTION SECTION:
;www.ac-nice.fr.                IN      A

;; ANSWER SECTION:
www.ac-nice.fr.                3600    IN      CNAME   www.ac-nice.fr.cdn.cloudflare.net.
www.ac-nice.fr.cdn.cloudflare.net. 300    IN      A       141.101.90.107
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

;; Query time: 72 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)
;; WHEN: Wed Mar 18 20:13:31 CET 2026
;; MSG SIZE rcvd: 182

root@DS1: ~#_
```

3. Vérifications depuis le client DD1/UD1

3.1. Demande de résolution interne

Je vérifie depuis DD1 que la commande retourne bien le serveur DS1

```
sio@DD1:~$ dig SOA intra.sio-exupery.fr

; <<>> DiG 9.20.18-1~deb13u1-Debian <<>> SOA intra.sio-exupery.fr
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 17029
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: fc67c7eeac6be8190100000069baf9abf4210a76af499cba (good)
;; QUESTION SECTION:
;intra.sio-exupery.fr.          IN      SOA

;; ANSWER SECTION:
intra.sio-exupery.fr.          86400   IN      SOA     DS1.intra.sio-exupery.fr. root.i
ntra.sio-exupery.fr. 503202602 604800 86400 2419200 604800

;; Query time: 0 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)
;; WHEN: Wed Mar 18 20:14:53 CET 2026
;; MSG SIZE rcvd: 122
```

```

sio@DD1:~$ dig www.ac-nice.fr

; <<> DiG 9.20.18-1-deb13u1-Debian <<> www.ac-nice.fr
;; global options: +cmd
;; Got answer:
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 30099
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: c5b376b36d8dfc7c0100000069bafa34902b5bc8152bbc6b (good)
;; QUESTION SECTION:
;www.ac-nice.fr.                IN      A

:: ANSWER SECTION:
www.ac-nice.fr.                3383   IN      CNAME   www.ac-nice.fr.cdn.cloudflare.net.
www.ac-nice.fr.cdn.cloudflare.net. 83 IN A      141.101.90.105
www.ac-nice.fr.cdn.cloudflare.net. 83 IN A      141.101.90.107
www.ac-nice.fr.cdn.cloudflare.net. 83 IN A      141.101.90.104
www.ac-nice.fr.cdn.cloudflare.net. 83 IN A      141.101.90.106

;; Query time: 7 msec
;; SERVER: 192.168.4.254#53(192.168.4.254) (UDP)

```

3.2. Demande de résolution externe

Depuis ma machine physique windows 11 depuis le cmd je tape la commande route print

```
Administrator: Invite de commandes
Microsoft Windows [version 10.0.22000.2538]
(c) Microsoft Corporation. Tous droits réservés.
C:\Windows\system32>route print
=====
Liste d'Interfaces
25...cc 28 aa 4c 5e 59 .....Realtek PCIe GbE Family Controller
47...0a 00 27 00 00 2f .....VirtualBox Host-Only Ethernet Adapter
 9...d0 65 78 6d 35 27 .....Microsoft Wi-Fi Direct Virtual Adapter #5
 7...d2 65 78 6d 35 26 .....Microsoft Wi-Fi Direct Virtual Adapter #6
10...00 50 56 c0 00 01 .....VMware Virtual Ethernet Adapter for VMnet1
 3...00 50 56 c0 00 08 .....VMware Virtual Ethernet Adapter for VMnet8
24...d0 65 78 6d 35 26 .....Intel(R) Wi-Fi 6 AX201 160MHz
20...d0 65 78 6d 35 2a .....Bluetooth Device (Personal Area Network)
 1.....Software Loopback Interface 1
=====

IPv4 Table de routage
=====
Itinéraires actifs :
Destination réseau    Masque réseau    Adr. passerelle    Adr. interface    Métrique
-----
 0.0.0.0              0.0.0.0          192.168.68.1       192.168.68.108    35
 127.0.0.0            255.0.0.0        On-link            127.0.0.1         331
 127.0.0.1            255.255.255.255 On-link            127.0.0.1         331
127.255.255.255      255.255.255.255 On-link            127.0.0.1         331
192.168.44.0         255.255.255.0   On-link            192.168.44.1      291
192.168.44.1         255.255.255.255 On-link            192.168.44.1      291
192.168.44.255      255.255.255.255 On-link            192.168.44.1      291
192.168.56.0         255.255.255.0   On-link            192.168.56.1      330
192.168.56.1         255.255.255.255 On-link            192.168.56.1      330
```

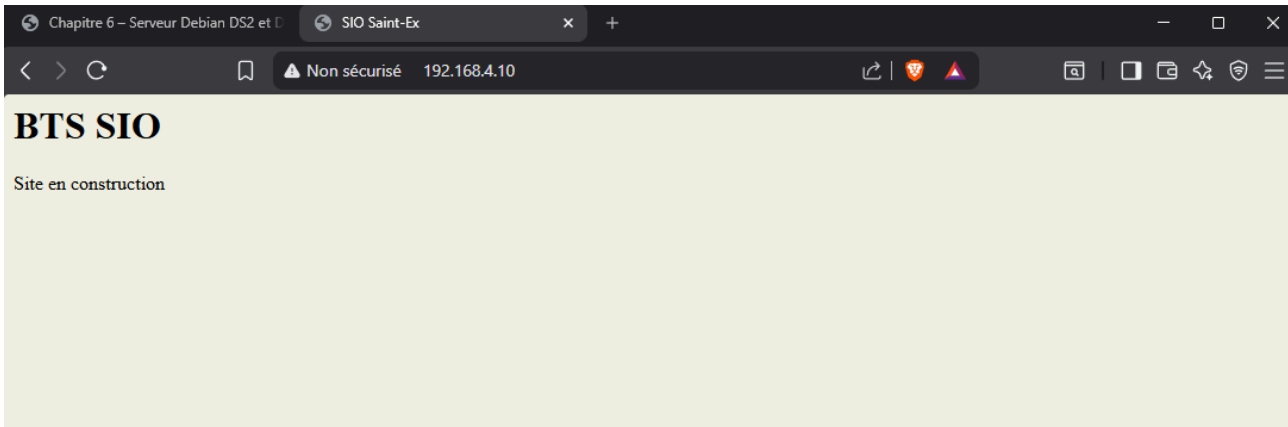
J'ajoute une route statique

```
C:\Windows\system32>route add 192.168.4.0 mask 255.255.255.0 192.168.68.62
OK!
C:\Windows\system32>
```

J'affiche la nouvelle table de routage

```
IPv4 Table de routage
=====
Itinéraires actifs :
Destination réseau    Masque réseau  Adr. passerelle  Adr. interface  Métrique
0.0.0.0              0.0.0.0       192.168.68.1    192.168.68.108  35
127.0.0.0            255.0.0.0     On-link         127.0.0.1       331
127.0.0.1           255.255.255.255  On-link         127.0.0.1       331
127.255.255.255     255.255.255.255  On-link         127.0.0.1       331
192.168.4.0         255.255.255.0   192.168.68.62   192.168.68.108  36
192.168.44.0        255.255.255.0   On-link         192.168.44.1    291
192.168.44.1        255.255.255.255  On-link         192.168.44.1    291
192.168.44.255     255.255.255.255  On-link         192.168.44.1    291
```

Sur ma machine physique je tape l'adresse IP 192.168.4.10 comme Url



Je mets comme DNS principale 192.168.4.10 sur ma machine physique

