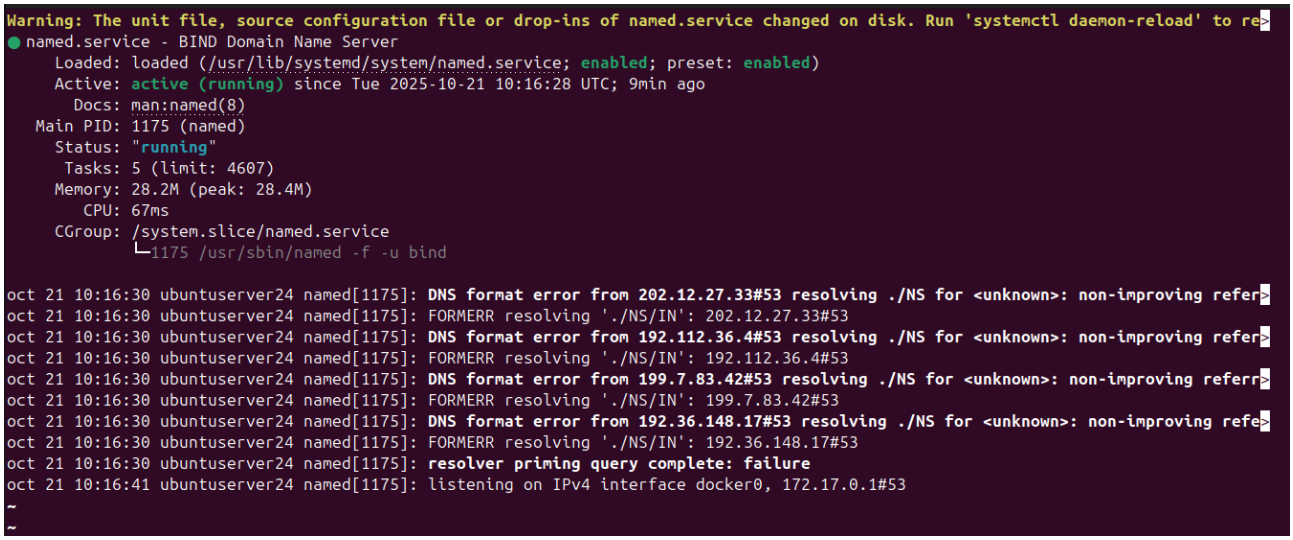
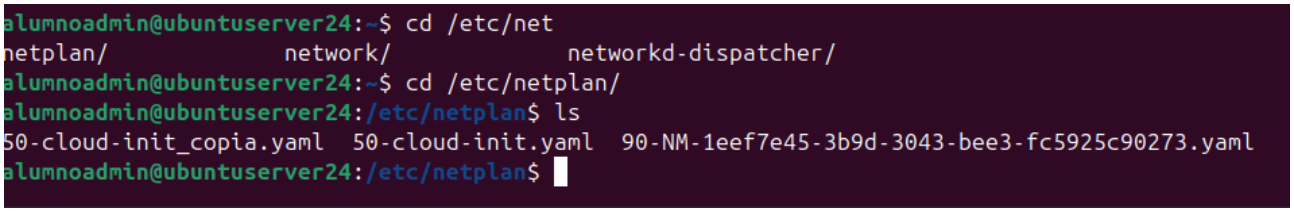
EJERCICIO 1

Demueustro que esta instalado el servicio de DNS y configuro las interfaces de red





```
alumnoadmin@ubuntuserver24:/etc/netplan$ sudo nano 50-cloud-init.yaml
[sudo] password for alumnoadmin:
alumnoadmin@ubuntuserver24:/etc/netplan$ sudo netplan
apply     generate  get       help      info      ip        rebind    set       status    try
alumnoadmin@ubuntuserver24:/etc/netplan$ sudo netplan apply
alumnoadmin@ubuntuserver24:/etc/netplan$ ifconfig
docker0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        inet 172.17.0.1  netmask 255.255.0.0  broadcast 172.17.255.255
        ether 72:87:b5:0e:4f:49  txqueuelen 0  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.100  netmask 255.255.255.0  broadcast 192.168.1.255
        ether 08:00:27:e6:48:96  txqueuelen 1000  (Ethernet)
        RX packets 88292  bytes 132870518 (132.8 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 5455  bytes 347404 (347.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 97  bytes 9769 (9.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 97  bytes 9769 (9.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

alumnoadmin@ubuntuserver24:/etc/netplan$
```

```
alumnoadmin@ubuntuserver24:/etc/netplan$ sudo nano 50-cloud-init.yaml
alumnoadmin@ubuntuserver24:/etc/netplan$ sudo netplan apply
alumnoadmin@ubuntuserver24:/etc/netplan$ systemctl status bind9.service
● named.service - BIND Domain Name Server
     Loaded: loaded (/usr/lib/systemd/system/named.service; enabled; preset: enabled)
     Active: active (running) since Tue 2025-10-21 10:16:28 UTC; 18min ago
       Docs: man:named(8)
   Main PID: 1175 (named)
     Status: "running"
      Tasks: 5 (limit: 4607)
     Memory: 28.2M (peak: 28.4M)
        CPU: 70ms
     CGroup: /system.slice/named.service
             └─1175 /usr/sbin/named -f -u bind

oct 21 10:32:00 ubuntuserver24 named[1175]: no longer listening on 192.168.0.100#53
oct 21 10:32:00 ubuntuserver24 named[1175]: no longer listening on 10.0.2.15#53
oct 21 10:32:02 ubuntuserver24 named[1175]: listening on IPv4 interface enp0s3, 192.168.1.100#53
oct 21 10:32:02 ubuntuserver24 named[1175]: listening on IPv4 interface enp0s3, 192.168.0.100#53
oct 21 10:32:02 ubuntuserver24 named[1175]: listening on IPv4 interface enp0s3, 10.0.2.15#53
oct 21 10:32:40 ubuntuserver24 named[1175]: no longer listening on 10.0.2.15#53
oct 21 10:34:19 ubuntuserver24 named[1175]: no longer listening on 192.168.1.100#53
oct 21 10:34:19 ubuntuserver24 named[1175]: no longer listening on 192.168.0.100#53
oct 21 10:34:22 ubuntuserver24 named[1175]: listening on IPv4 interface enp0s3, 192.168.1.100#53
oct 21 10:34:22 ubuntuserver24 named[1175]: listening on IPv4 interface enp0s3, 192.168.0.100#53
alumnoadmin@ubuntuserver24:/etc/netplan$
```

EJERCICIO 2

Copio el archivo predeterminado local del db a uno con el nombre de nuestro dominio y en ese mismo archivo modificamos todos los localhost por la ip que modificamos anteriormente

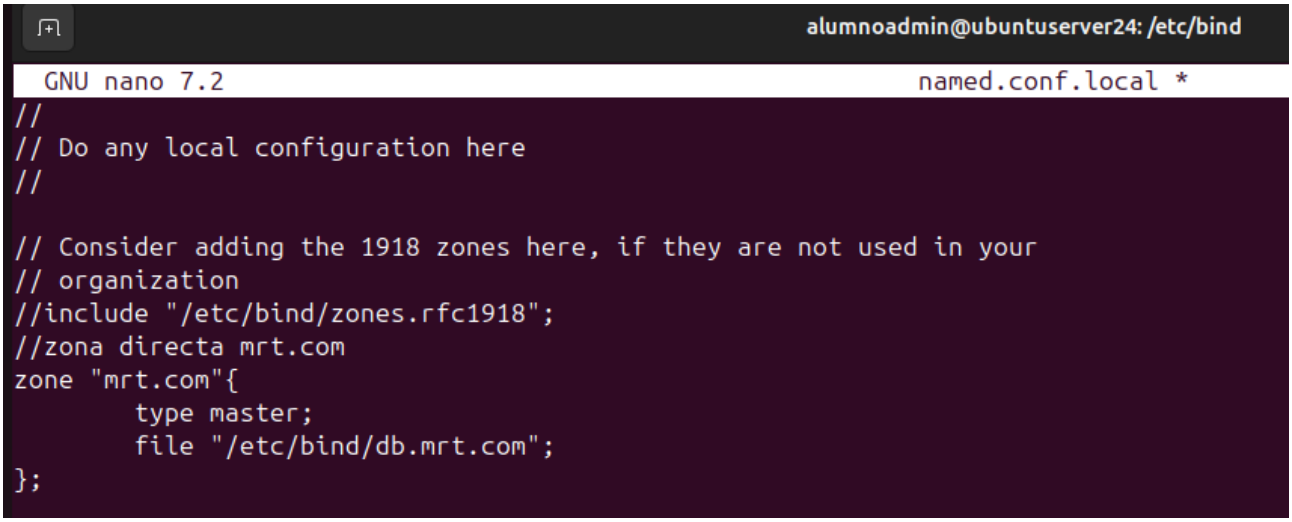
```
alumnoadmin@ubuntuserver24:/etc/bind$ sudo cp db.local db.mrt.com
alumnoadmin@ubuntuserver24:/etc/bind$ ls
bind.keys  db.127  db.empty  db.mrt.com  named.conf.default-zones  named.conf.options  zones.rfc1918
db.0       db.255  db.local  named.conf  named.conf.local          rndc.key
alumnoadmin@ubuntuserver24:/etc/bind$
```

```
alumnoadmin@ubuntuserver24:/etc/bind$ nslookup mrt.com
Server:         192.168.1.100
Address:        192.168.1.100#53

Name:   mrt.com
Address: 192.168.1.100
Name:   mrt.com
Address: ::1

alumnoadmin@ubuntuserver24:/etc/bind$
```

```
 GNU nano 7.2                                                db.mrt.com
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     mrt.com. root.mrt.com. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      mrt.com.
@       IN      A       192.168.1.100
@       IN      AAAA    ::1
```

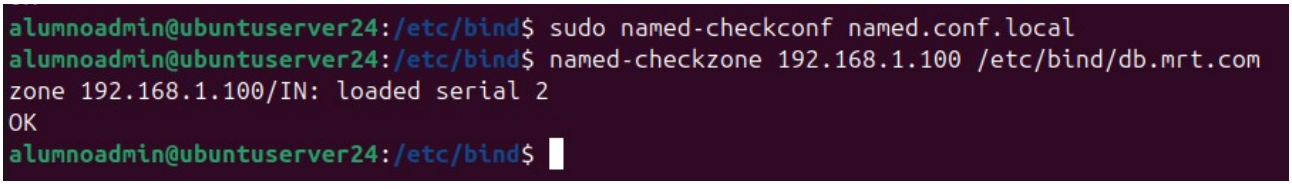
EJERCICIO 3

Ahora modificamos el archivo named.conf.local para configurar la zona directa en el cual tendremos que modificar el dominio que haya por el nuestro mas su ruta.



EJERCICIO 4

Hacemos el checzone y el checkconf para comprobar que los archivos no fallan



EJERCICIO 4B

Configuramos los forwarders a la DNS de google que es la 8,8,8,8 y comprobamos el estado del servicio

```
  GNU nano 7.2                                          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 {
        //      8.8.8.8;
        // };

        //========================================================================
        // 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 auto;

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

```
alumnoadmin@ubuntuserver24:/etc/bind$ sudo systemctl restart bind9
alumnoadmin@ubuntuserver24:/etc/bind$ sudo systemctl status bind9
● named.service - BIND Domain Name Server
     Loaded: loaded (/usr/lib/systemd/system/named.service; enabled; preset: enabled)
     Active: active (running) since Tue 2025-10-21 10:53:26 UTC; 8s ago
       Docs: man:named(8)
   Main PID: 6758 (named)
     Status: "running"
      Tasks: 4 (limit: 4607)
     Memory: 22.4M (peak: 22.7M)
        CPU: 47ms
     CGroup: /system.slice/named.service
             └─6758 /usr/sbin/named -f -u bind

oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './NS/IN': 192.5.5.241#53
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './DNSKEY/IN': 170.247.170.2#53
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './NS/IN': 170.247.170.2#53
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './DNSKEY/IN': 192.58.128.30#53
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './NS/IN': 192.58.128.30#53
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './DNSKEY/IN': 192.36.148.17#53
oct 21 10:53:26 ubuntuserver24 named[6758]: managed-keys-zone: Unable to fetch DNSKEY set '.': failure
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './NS/IN': 192.36.148.17#53
oct 21 10:53:26 ubuntuserver24 named[6758]: network unreachable resolving './NS/IN': 198.41.0.4#53
oct 21 10:53:26 ubuntuserver24 named[6758]: resolver priming query complete: failure
alumnoadmin@ubuntuserver24:/etc/bind$
```

EJERCICIO 5

Aqui edito los ficheros .conf y cambio el enlace simbólico de /etc/resolv.conf y apuntarlo al siguiente fichero /run/systemd/resolve/resolv.conf

```
  GNU nano 7.2                                          /run/systemd/resolve/resolv.conf
# This is /run/systemd/resolve/resolv.conf managed by man:systemd-resolved(8).
# Do not edit.
#
# This file might be symlinked as /etc/resolv.conf. If you're looking at
# /etc/resolv.conf and seeing this text, you have followed the symlink.
#
# This is a dynamic resolv.conf file for connecting local clients directly to
# all known uplink DNS servers. This file lists all configured search domains.
#
# Third party programs should typically not access this file directly, but only
# through the symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a
# different way, replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.
domain mrt.com
nameserver 192.168.1.100
options endns0 trsut-ad
search .
```

```
  GNU nano 7.2                                          /etc/systemd/resolved.conf
#  This file is part of systemd.
#
#  systemd is free software; you can redistribute it and/or modify it under the
#  terms of the GNU Lesser General Public License as published by the Free
#  Software Foundation; either version 2.1 of the License, or (at your option)
#  any later version.
#
# Entries in this file show the compile time defaults. Local configuration
# should be created by either modifying this file (or a copy of it placed in
# /etc/ if the original file is shipped in /usr/), or by creating "drop-ins" in
# the /etc/systemd/resolved.conf.d/ directory. The latter is generally
# recommended. Defaults can be restored by simply deleting the main
# configuration file and all drop-ins located in /etc/.
#
# Use 'systemd-analyze cat-config systemd/resolved.conf' to display the full config.
#
# See resolved.conf(5) for details.

[Resolve]
# Some examples of DNS servers which may be used for DNS= and FallbackDNS=:
# Cloudflare: 1.1.1.1#cloudflare-dns.com 1.0.0.1#cloudflare-dns.com 2606:4700:4700::1111#cloudflare-dns.com 2606:4700:4700::1001#cl>
# Google:     8.8.8.8#dns.google 8.8.4.4#dns.google 2001:4860:4860::8888#dns.google 2001:4860:4860::8844#dns.google
# Quad9:      9.9.9.9#dns.quad9.net 149.112.112.112#dns.quad9.net 2620:fe::fe#dns.quad9.net 2620:fe::9#dns.quad9.net
DNS=192.168.1.100
#FallbackDNS=
#Domains=
#DNSSEC=no
#DNSOverTLS=no
#MulticastDNS=no
#LLMNR=no
                                        [ Wrote 37 lines ]
^G Help        ^O Write Out   ^W Where Is    ^K Cut         ^T Execute     ^C Location    M-U Undo       M-A Set Mark
^X Exit        ^R Read File   ^\ Replace     ^U Paste       ^J Justify     ^/ Go To Line  M-E Redo       M-6 Copy
```

```
alumnoadmin@ubuntuserver24:/etc/bind$ cd ..
alumnoadmin@ubuntuserver24:/etc$ sudo nano resolv.conf
alumnoadmin@ubuntuserver24:/etc$ sudo ln -sf /run/systemd/resolve/resolv.conf /etc/resolv.conf
alumnoadmin@ubuntuserver24:/etc$ ls -l /etc/resolv.conf
lrwxrwxrwx 1 root root 32 oct 21 10:55 /etc/resolv.conf -> /run/systemd/resolve/resolv.conf
alumnoadmin@ubuntuserver24:/etc$
```

EJERCICIO 6

Captura del fichero db.mrt.com y comprobacion de zona

```
 GNU nano 7.2                                                  db.mrt.com
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     mrt.com. root.mrt.com. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      mrt.com.
@       IN      A       192.168.1.100
@       IN      AAAA    ::1
dn      IN      A       192.168.1.100
ubuntuserver    IN      A       192.168.1.100
www     IN      CNAME   ubuntuserver
```

```
alumnoadmin@ubuntuserver24:/etc/bind$ sudo nano db.mrt.com
alumnoadmin@ubuntuserver24:/etc/bind$ named-checkzone 192.168.1.100 /etc/bind/db.mrt.com
zone 192.168.1.100/IN: loaded serial 2
OK
alumnoadmin@ubuntuserver24:/etc/bind$
```

```
alumnoadmin@ubuntuserver24:/etc/bind$ nslookup mrt.com
Server:         192.168.1.100
Address:        192.168.1.100#53

Name:   mrt.com
Address: 192.168.1.100
Name:   mrt.com
Address: ::1

alumnoadmin@ubuntuserver24:/etc/bind$
```

EJERCICIO 7

Creacion de la zona de busqueda inversa.

```
  GNU nano 7.2                                          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";
//zona directa mrt.com
zone "mrt.com"{
        type master;
        file "/etc/bind/db.mrt.com";
};
//zona de busqueda inveresa
zone "168.192.in-addr.arpa" {
        type master;
        file "/etc/bind/db.168.192";
};
```

EJERCICIO 8

Configuro el archivo de busqueda inversa

```
 GNU nano 7.2                                                db.168.192
;
; BIND reverse data file for local loopback interface
;
$TTL    604800
@       IN      SOA     mrt.com. root.mrt.com. (
                              1         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      mrt.com.
100.1   IN      PTR     mrt.com.
```

EJERCICIO 9

Comprobacion de que funciona

```
alumnoadmin@ubuntuserver24:/etc/bind$ named-checkconf named.conf.local
alumnoadmin@ubuntuserver24:/etc/bind$ named-checkzone 192.168.1.100 db.168.192
zone 192.168.1.100/IN: loaded serial 1
OK
alumnoadmin@ubuntuserver24:/etc/bind$
```

```
alumnoadmin@ubuntuserver24:/etc/bind$ sudo systemctl restart bind9
alumnoadmin@ubuntuserver24:/etc/bind$ sudo systemctl status bind9
● named.service - BIND Domain Name Server
     Loaded: loaded (/usr/lib/systemd/system/named.service; enabled; preset: enabled)
     Active: active (running) since Tue 2025-10-21 11:21:33 UTC; 8s ago
       Docs: man:named(8)
   Main PID: 7139 (named)
     Status: "running"
      Tasks: 4 (limit: 4607)
     Memory: 22.4M (peak: 22.7M)
        CPU: 48ms
     CGroup: /system.slice/named.service
             └─7139 /usr/sbin/named -f -u bind

oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './NS/IN': 198.41.0.4#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './DNSKEY/IN': 192.33.4.12#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './NS/IN': 192.33.4.12#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './DNSKEY/IN': 199.7.83.42#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './NS/IN': 199.7.83.42#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './DNSKEY/IN': 192.112.36.4#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './NS/IN': 192.112.36.4#53
oct 21 11:21:33 ubuntuserver24 named[7139]: network unreachable resolving './NS/IN': 2801:1b8:10::b#53
oct 21 11:21:33 ubuntuserver24 named[7139]: resolver priming query complete: failure
oct 21 11:21:33 ubuntuserver24 named[7139]: managed-keys-zone: Unable to fetch DNSKEY set '.': failure
alumnoadmin@ubuntuserver24:/etc/bind$
```

EJERCICIO 10

Utilizo el comando host para comprobar que funciona

```
alumnoadmin@ubuntuserver24:/etc/bind$ sudo host www.mrt.com
www.mrt.com is an alias for ubuntuserver.mrt.com.
ubuntuserver.mrt.com has address 192.168.1.100
alumnoadmin@ubuntuserver24:/etc/bind$ sudo host mrt.com
mrt.com has address 192.168.1.100
mrt.com has IPv6 address ::1
alumnoadmin@ubuntuserver24:/etc/bind$
```

EJERCICIO 11

Con el comando dig ves toda la informaacion de confguracion del DNS

```
alumnoadmin@ubuntuserver24:/etc/bind$ dig mrt.com

; <<>> DiG 9.18.39-0ubuntu0.24.04.1-Ubuntu <<>> mrt.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 26257
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 36f46bd018a5d2c10100000068f76d56d4c3fc554a015541 (good)
;; QUESTION SECTION:
;mrt.com.                       IN      A

;; ANSWER SECTION:
mrt.com.                604800  IN      A       192.168.1.100

;; Query time: 0 msec
;; SERVER: 192.168.1.100#53(192.168.1.100) (UDP)
;; WHEN: Tue Oct 21 11:24:06 UTC 2025
;; MSG SIZE  rcvd: 80

alumnoadmin@ubuntuserver24:/etc/bind$
```

EJERCICIO 12

Luego el comando nslookup para comprobar la funcionalidad del DNS.

```
alumnoadmin@ubuntuserver24:/etc/bind$ nslookup mrt.com
Server:         192.168.1.100
Address:        192.168.1.100#53

Name:   mrt.com
Address: 192.168.1.100
Name:   mrt.com
Address: ::1

alumnoadmin@ubuntuserver24:/etc/bind$
```