

Lab 8

Optional LAB — Configuring the DNS server

8.1 Objectives

Being able to configure a DNS server with primary and secondary zones

8.2 Before you start

- What is the configuration file of the DNS server `named`?
- How do you define a primary area?
- What type of DNS record allows you to add a direct translation?
- What type of DNS record allows you to add a reverse translation?

8.3 Using dig

The command `dig` is quite useful for solving problems related to DNS. `dig` allow us to make DNS requests from the command line.

```
# dig www.fib.upc.edu
; <<>> DiG 9.3.4 <<>> www.fib.upc.edu
;; global options:  printcmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53021
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 4, ADDITIONAL: 4
;; QUESTION SECTION:
;www.fib.upc.edu.                IN      A
;; ANSWER SECTION:
www.fib.upc.edu.                172800 IN      A      147.83.41.7
...
;; Query time: 28 msec
;; SERVER: 147.83.41.104#53(147.83.41.104)
;; WHEN: Thu May 10 10:59:03 2007
;; MSG SIZE rcvd: 203
```

In the previous example we made a request for `www.fib.upc.edu` domain using the configured DNS server. Very often want to make the request directly against another server. This can be done using the `@` option.

```
$ dig @server request
```

The `-x` option can be used to make request for reverse translations:

```
$ dig @server -x ip_address
```

Another option that is very useful is `-t`. With this option it is possible to make requests for a particular type of DNS records (eg A, NS, MX, ...).

8.4 Configuring the server

8.4.1 Basic Configuration

Download the source code of the `bind` package from the `sources` directory of ASO sftp server.¹ You should unpack, configure, compile and install this package (`bind-9.4.1.tar.gz`)

Install the DNS server

Create the file `/etc/named.conf` and add the following configuration for having a basic DNS server for the localhost domain:

```
options {
    directory "/var/named";
};

zone "localhost" {
    type master;
    file "local.zone";
};

zone "127.in-addr.arpa" {
    type master;
    file "127.zone";
};
```

What is the meaning of each sentence in this file?

The `rndc` tool allows to submit certain operations to control the DNS server (eg. notify it to re-read the configuration file). Before using it you have to configure the communication between `rndc` and the DNS server (`named`). For doing that follow these steps:

Run the command:

```
# Rndc-confgen> / etc / rndc.conf
```

Check the generated file and copy the settings at the end of this file to the `named.conf` file

Configure localhost zones

The file `local.zone` contains the DNS records for the direct mapping of the localhost zone. Create this file with the following content:

```
$TTL      604800
@         IN      SOA      localhost. root.localhost. (
                        1          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        604800 )   ; Negative Cache TTL
;
@         IN      NS       localhost.
@         IN      A        127.0.0.1
```

The file `127.in-addr.arpa` should contain the mapping for the inverse resolution of the localhost zone. Create it with the following content:

¹The password may be found in Lab 1.

```

$TTL      604800
@         IN      SOA      localhost. root.localhost. (
                        1          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        604800 )   ; Negative Cache TTL
;
@         IN      NS       localhost.
1.0.0    IN      PTR      localhost.

```

Start the DNS server

Start the name server using the command:

```
named
```

You can use the `-g` option for testing purposes. It prints all the output of the server the screen instead of the log files.

To test the server try for example:

```
dig @127.0.0.1 localhost
```

And for the inverse resolution, try:

```
dig @127.0.0.1 -x 127.0.0.1
```

- What IP you have obtained with the direct resolution?
- And what is the answer in the case of the inverse resolution?

DNS forwarders

Due to the faculty firewall your server can not resolve external names directly so you can configure it to access a server that redirects names requests (this type of configuration is known as forwarder).

Edit the `named.conf` and add the following option:

```
forwarders {
    147.83.41.104;
};
```

Once the settings have been changed you can notify the server to re-load the configuration file using the `rndc reload` command.

Now try to resolve an external address as `www.fib.upc.edu` to see if it is functioning properly.

8.5 Primary DNS server

8.5.1 Changing the default DNS server

First of all, modify your local configuration of the DNS default server in the file `resolv.conf` for using your own DNS server

(Optional) This change only lasts until you reboot because `resolv.conf` will be overwritten by DHCP. To avoid this you can add the following option in `/etc/dhclient.conf`:

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

8.5.2 Configuring zones

We are going to configure the zone "group" for which we will be the primary server. In this zone there are three records:

- serveraso with IP 10.10.41.97.
- self that has your own IP.
- 'we' as an alias of self.

Modify the configuration file properly and create the zone files. Finally, notify the server and verify that you've done to dig properly.

Hint: In case of problems you can use the tools `named-checkconf` and `named-checkzone`. In `/var/log/daemon` you have also some information about the status of the DNS server.

8.6 Secondary DNS server

Now we are going to configure the zone "aso" as a secondary DNS server. In this case is not necessary to create a zone file because it will be automatically transferred by the primary server (in this case the ASO server).

Modify the file `named.conf` and add the description of the "aso" zone as a secondary server.

What changes you have introduced into the file <code>named.conf</code> ? (Hint: You can use the option <code>masters</code> and type <code>slave</code>)

Bibliography