



## Lab Exercise 2 – Recursive DNS Server

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### **Objectives**

Install a recursive DNS server.

### **Background**

A recursive server is a type of DNS server that performs DNS lookups for client resolvers. It has the capability of caching results for a time specified in the Time to Live (TTL).

### **What You Need**

Linux Server with BIND already installed (finished Lab 1).

### **Steps**

1. Create a directory in `/var/named`. Let us call this folder “recursive.”

```
mkdir /var/named
mkdir /var/named/recursive
cd /var/named/recursive
```

2. Download the `root.hints` file from the fileserver and save in the recursive folder. This is

Note: `root.hints`, `db.cache`, `named.cache`, `named.ca`, `named.root` usually refer to the same file.

3. Using VI or your favorite text editor, create a file called `named.conf`. This is the BIND configuration file.

```
vi named.conf
```

- a. The *options* statement is where you can add global options to be used as defaults by BIND. Only one options field should be defined in the configuration file. For now, let us define the working directory as follows.

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

- b. Next add the recursive/caching name server configuration

```
zone "." {
    type hint;
    file "root.hints";
```

```
};
```

- c. Define a localhost zone that maps it to the loopback address 127.0.0.1.

```
zone "localhost" {
    type master;
    file "db.localhost";
};
```

- d. Configure the loopback zones for IPv4 and IPv6. (**SKIP** this part if you have not discussed Reverse DNS yet).

```
zone "0.0.127.in-addr.arpa" {
    type master;
    file "db.127.0.0.1";
};

zone "0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0. \
    0.0.0.0.0.ip6.arpa" {
    type master;
    file "db.ip6";
};
```

4. Create the zone files and put them in the /var/named/recursive directory.

- a. Create a zone file **db.localhost** for forward zones.

```
$TTL 1d
@      SOA      localhost.  root.localhost.  (
                                20121115      ;serial no.
                                30m           ;refresh
                                15m           ;retry
                                1d            expire
                                30m           ;negative cache ttl
                                )
      NS       localhost.
      A        127.0.0.1
```

- b. Create the reverse loopback zonefile **db.127.0.0.1** and **db.ip6**. (Skip if you didn't do step 3.d)

```
$TTL 1d
@      SOA      localhost.  root.localhost.  (
                                1              ;serial no.
                                30m           ;refresh
                                15m           ;retry
                                1d            expire
                                30m           ;negative cache ttl
                                )
      NS       localhost.
1 PTR        localhost
```

5. Try running bind with -g and -c named.conf and see if BIND complains for errors.

```
named -g -c named.conf
```

6. Test recursive name server to get an A & AAAA record of www.apnic.net

```
dig @127.0.0.1 www.myzone.net
dig @127.0.0.1 www.myzone.net AAAA
```

Test your recursive name server to query other RRs like SOA, MX, and PTR records. To verify that your server caches information, query the same RR twice and compare the query time.

The complete `named.conf` for a recursive server is as follows:

```
options {  
    directory "/var/named/recursive";  
};  
  
// recursive name server config  
zone "." {  
    type hint;  
    file "root.hint";  
};  
  
zone "localhost" {  
    type master;  
    file "db.localhost" ;  
};  
  
zone "0.0.127.in-addr.arpa" {  
    type master;  
    file db.127.0.0;  
};  
  
zone  
"0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.ip6.arpa" {  
    type master;  
    file "db.ip6";  
    allow-update { none; };  
};
```