AfNOG 2003 Kampala, Uganda
Track 1 – Scalable Internet Services

Domain Name System – Exercise 4

Setting up an Autoritative-Only Primary/Master Name Server

In the previous exercise we setup a caching-only name server. In this exercise we will setup an authoritative primary/master name server.

1. Edit the `/etc/namedb/named.conf` file and change the directive "recursion" from **yes** to **no** and delete the line that has the "allow-query" directive. It should look like the entry below after your edits.

```
options {
        directory "/etc/namedb";
        recursion no;
};
```

2. Restart the name daemon and test to see if your server is still resolving recursively.

```
# ndc restart
# dig @81.199.110.# isc.org ns
```

Question: Is your named server resolving recursively? _____

What could be the reason?

Answer:_____

3. Change directory to `/etc/namedb`

```
# cd /etc/namedb
```

4. Create the primary and secondary zone file directories.

```
# mkdir m
# mkdir s
```

5. Create the zone file for your domain **<domain-name>.afnogws.gh**.

```
# vi m/<domain-name>.db
```

Add the following lines to the **<domain-name>.db** file.

```
$TTL 1d
@  IN    SOA    pc#.t1.ws.afnog.org.  root.<domain-name>.afnogws.gh.
(
                              2003061000  ;serial YYYYMMDDnn
                              6h          ;refresh
                              1h          ;retry
                              2w          ;expire
                              1h          ;nttl
                              )

@         IN    NS    pc#.t1.ws.afnog.org.
          IN    A     81.199.110.#

www       IN    A     81.199.110.#
```

Note: Replace all instances of "<domain-name>" with your master/primary zone on the worksheet or one that you have selected to use, and # with your pc number.

6. Edit the `/etc/namedb/named.conf` file and make the following entry at the end of the file.

```
zone "<domain-name>.afnogws.gh" {
            type master;
            file "m/<domain-name>.db";
};
```

Note: Replace <domain-name> with your master/primary zone on the worksheet or one that you have selected to use.

7. Reload the zone files.

```
# ndc reload
```

8. Check if named is running by issuing the following command.

```
# ps -aux | grep named
```

9. Check the version of BIND you are running.

```
# /usr/sbin/named -v
```

10. Test if your server is able to resolve the domain <domain-name>.afnogws.gh.

```
# dig @127.0.0.1 www.<domain-name>.afnogws.gh a
# dig @81.199.110.100 www.<domain-name>.afnogws.gh a
```

Question: Was your server able to resolve your domain in the first command?

Answer:_____

Question: Was the 81.199.110.100 server able to resolve your domain in the second command?

Answer:_____

Question: Why was the 81.199.110.100 server unable to resolve your domain?

Answer:_____

Ask a friend to setup a slave/secondary name server for your domain (Refer to your worksheet). Remember in real life you should look for a secondary name server on a different network (see RFC-2182).

This takes us to the next exercise where you will be setting up a secondary name server for a friend. ;o)

Fill out the following for your friend who is going to setup a secondary/slave name server for your domain.

Request For Secondary Name Server

Domain Name :.....

Primary Name Servers FQDN :.....

Primary Name Servers IP Address :.....

You friend will have to fill this section for you

Secondary Name Servers FQDN :.....

Secondary Name Servers IP Address:.....

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Domain Name System – Exercise 5

Setting up an Authoritative Slave/Secondary Name Server

In this exercise you will setup secondary name services on your computer for the computer next to you. Please refer to the worksheet given to you.

Talk to the person sitting next to you to provide secondary name services for your domain based on the worksheet provided.

Do the following on your own computer.

Edit the **`/etc/namedb/m/<domain-name>.db`** *(where <domain-name>.db is the zone file you created in the previous exercise)* and make an entry in there for a secondary name server.

The entries will look something like:

```
<……After your SOA record……>

                                IN     NS     pc#.t1.ws.afnog.org.
                                IN     NS     pc##.t1.ws.afnog.org.
                                IN     A      81.199.110.#
;
; Address (A) records go in this section.
;
pc#.t1.ws.afnog.org.            IN     A      81.199.110.#
pc##.t1.ws.afnog.org.           IN     A      81.199.110.##
```

NOTE: DO NOT FORGET to increase the serial number in the zone file (usually by 1).

Do the following on your computer for your friend, and your friend should be doing the same for you.

1. Edit the `/etc/namedb/named.conf` file and make the following entry.

```
zone "<friends-domain-name>.afnogws.gh" {
            type slave;
            file "s/<friends-domain-name>.db";
            masters {
                        81.199.110.##;
                  };
};
```

Replace `<friends-domain-name>` with the domain name of your friend. Please refer the worksheet.

Replace ## in the IP address with the IP address of the computer next to you.

2. Reload the zone files.

```
# ndc reload
```

3. Check the log file `/var/log/messages` to ensure that your named server started without any errors.

4. Check if the <friends-domain-name>.db file exists in the `/etc/namedb/s` directory. If it does exist, it means the secondary server has transferred the zone file from the primary name server. This file is created by the named daemon.

```
# ls -al  /etc/namedb/s
```

5. If it does not exist you will have to debug the problem to figure out what the problem could be. Your main debugging tool here will be the log file `/var/log/messages`.

6. Once you get the <friends-domain-name>.db file in the /etc/namedb/s directory, Test if your server is resolving the domain.

```
# dig @127.0.0.1  <friends-domain-name>.afnogws.gh ns
```

Where <friends-domain-name> is the domain for which you are running secondary name services.

7. Test if the secondary your friend setup for you works.

```
# dig @81.199.110.## <domain-name>.afnogws.gh ns +norec
```

NOTE: You have just successfully setup a secondary name server for your friend. Ensure that the secondary name server for your domain is also working. If you test it and it is working, **Congratulations!!!** you are now ready to go to the hostmaster for delegation of your domain.

8. Please fill the domain name request form below and submit it to the hostmaster.

Domain Name Request Form

Domain Name :.....

Primary Name Servers FQDN :.....

Primary Name Servers IP Address :.....

Secondary Name Servers FQDN :.....

Secondary Name Servers IP Address:.....

9. Once you get acknowledgement from the hostmaster about the delegation of your domain name, test it using dig.

```
# dig @81.199.110.100 <domain-name>.afnogws.gh ns +norec
```

Check if the name servers in the answer section are the same as that you submitted to the hostmaster.

10. Test recursively that data is consistent amongst all the name servers starting with:

```
# dig @a.root-servers.net <domain-name>.afnogws.gh ns +norec
```

YOU KNOW THE REST OF THE STORY……

HOSTMASTER CHECKS BEFORE DELEGATING ZONE

- **Are there two (2) or more name servers for the domain?**
- **Are all name servers reachable?**
- **Does the name match the IP address?**
- **Do all name servers give authoritative answers for SOA and NS queries? And are the results identical?**
- **Do the NS records in the zone match the requested delegation?**