DNS Exercise 3.1: Setting up a domain

In this exercise, you will create a new domain, _something_.ws.nsrc.org.
You will create master name service on your own machine, and someone else
will setup their machine to be a slave server for your domain. Then you
will ask the administrator for the domain above you (ws.nsrc.org.) to
delegate your domain to you.

1. Update Hostname if Necessary

Firstly, note that each machine in the classroom has been given a working
DNS name: pcX.ws.nsrc.org. Check that it is configured correctly by
using the `hostname` command - e.g. on pc23 you should see

```
# hostname
pc23.ws.nsrc.org
```

If not, then configure your server with its name: e.g. for pc23

```
# hostname pc23.ws.nsrc.org
```

You should also be able to see your machine's hostname at the login screen
on the console:

```
# cd
root@pc23:/root#
```

2. Update /etc/dhcp/dhclient.conf

At this time your machines are using dhcp to obtain an IP address. This would,
also, overwrite your /etc/resolv.conf file causing your resolver to no longer
query your machine by default.

But you can tell the DHCP client to automatically add the nameseervers you
choose by modifying the file /etc/dhcp/dhclient.conf:

To fix this edit the file:

```
# vi /etc/dhcp/dhclient.conf
```

Find the line that states:

#prepend domain-name-servers 127.0.0.1;

and change it to:

prepend domain-name-servers 127.0.0.1;

(remove the #)

let's manually shutdown then restart the DHCP client on your machine:

```
        # ps auxwww | grep dhclient3
```

You should see a line similar to this:

```
root       531  0.0  0.1   2928   800 ?        Ss   Apr16   0:00 dhclient3 -e IF_METRIC=100 -pf /var/run/dhclient.eth0.pid -lf /var/lib/dhcp/dhclient.eth0.leases -1 eth0
```

Note the Process ID (pid) of the dhclient process that is running. In this
case, it is 531. On your machine it will be different. You will need this in
order to shut down the client. To stop the client type:

```
        # kill <ProcessID>
```

Now, restart the DHCP client (please copy this line - don't try and type it in!

```
        # dhclient3 -e IF_METRIC=100 -pf /var/run/dhclient.eth0.pid -lf /var/lib/dhcp/dhclient.eth0.leases -1 eth0
```

Finally, we need to make sure that your /etc/resolv.conf file has the correct entries.
Take a look at it.

It should look something like this now:

```
nameserver 127.0.0.1
nameserver 10.10.0.241
nameserver 10.10.0.242
```

3. Create a Sub-Domain of ws.nsrc.org

* Choose a new domain, write it here:
`_____.ws.nsrc.org.`
  (Do not choose any of the pc names, e.g. `pc23`, as your subdomain)

*   Find someone who will agree to be slave for your domain. You must choose
    someone on a DIFFERENT table to you. (Remember RFC2182: secondaries must
    be on remote networks). You can have more than one slave if you wish.

*   Create your zone file in `/etc/bind/org.nsrc.ws.xxxxx.db`
    (where xxxxxx is your chosen domain).

* Copy and paste what is listed below to the file /etc/bind/org.nsrc.ws.xxxxxxx.db

        # vi /etc/bind/org.nsrc.ws.xxxxxx.db

```
$TTL 10m
@       IN     SOA    pcX.ws.nsrc.org.  yourname.example.com. (
                                    2012041800    ; Serial
                                    10m           ; Refresh
                                    10m           ; Retry
                                    4w            ; Expire
                                    10m )         ; Negative
@           IN      NS      pcX.ws.nsrc.org.       ; master
            IN      NS      pcY.ws.nsrc.org.       ; slave
;
www         IN      A       10.10.0.Y              ; your own IP
```

*   Replace `yourname.example.com.` with your home E-mail address, changing
    "@" to "." and adding a "." to the end. For instance, hervey@nsrc.org
    would be hervey.nsrc.org.

    Replace "X" with the number of your machine.
    Replace "Y" with the number of your neighbor's machine that will be your
    slave server.

    We have chosen purposely low values for TTL, refresh, and retry to make
    it easier to fix problems in the classroom. For a production domain you
    would use higher values, e.g. `$TTL 1d`

    Save the file and exit.
    Make sure the file is part of the bind group:

        # chgrp bind /etc/bind/org.nsrc.ws.xxxxxx.db

*   Edit `/etc/bind/named.conf` to configure your machine as master for your

domain. Below the three "include" lines add the following:

```
zone "xxxxxxx.ws.nsrc.org" {
        type master;
        file "/etc/bind/org.nsrc.ws.xxxxxx.db";
        allow-transfer { 10.10.X.Y; };
};
```

Where "X.Y" is the address of your neighbor who will be your slave server.

Save the file and exit.

* Check that your config file and zone file are valid, and then reload the nameserver daemon:

```
        # named-checkconf
        # named-checkzone xxxxx.ws.nsrc.org. /etc/bind/org.nsrc.ws.xxxxxxx.db
```

Note the trailing "." in the command above

* If there are any errors, correct them.

```
        # rndc reload
        # tail /var/log/syslog
```

If the bind9 daemon dies completely, then you may need to restart it:

```
        # service bind9 restart
```

* Verify that you can look up www.xxxx.ws.nsrc.org - This was an A record you placed in your zone file:

```
        # dig www.xxxxxxx.ws.nsrc.org
```

* Setting up Slave Server

To become a slave server for your neighbor (or your neighbor for you) we will create a directory where the slave zone file will be copied:

```
        # mkdir -p /var/cache/bind/zones/slave
```

Give the directories the necessary permissions so that the named process can write to them.

```
        # chown root:bind /var/cache/bind/zones
```

```
        # chown root:bind /var/cache/bind/zones/slave
        # chmod 775 /var/cache/bind/zones
        # chmod 775 /var/cache/bind/zones/slave
```

Now you need to add a slave entry in the /etc/bind/named.conf file for your neighbor's
new sub-domain. Your neighbor should have allowed your machine's IP address to transfer
in their /etc/bind/named.conf file in their master zone definition just as you did above.

Edit /etc/bind/named.conf and add a slave entry for your neighbors new sub-domain:

```
        # vi /etc/bind/named.conf

zone "yyyyy.ws.nsrc.org" {
        type slave;
        masters { 10.10.X.Y; };
        file "/var/cache/bind/zones/slave/org.nsrc.ws.yyyyyy.db";
        allow-transfer { none; };
};
```

Save the file and exit.

* Now restart bind and verify that you receive your neighbor's zone file in
/var/cache/bind/zones/slave. If there is no file, then look for errors in syslog and
fix those.

```
        # ls /var/cache/bind/zones/slave
```

if nothing in the directory check:

```
        # tail /var/log/syslog
```

* Check that you and your slaves are giving authoritative answers for
your domain:

```
        # dig +norec @10.10.X.Y xxxxx.ws.nsrc.org. soa
        # dig +norec @10.10.A.B xxxxx.ws.nsrc.org. soa
```

Check that you get an AA (authoritative answer) from both, and that
the serial numbers match.

* Now you are ready to request delegation. Bring the following form to
the classroom instructor:

Domain name: _____.ws.nsrc.org.

Master nameserver: pc____.ws.nsrc.org

Slave nameserver: pc____.ws.nsrc.org

Slave nameserver: pc____.ws.nsrc.org (optional)

Slave nameserver: pc____.ws.nsrc.org (optional)

* You will not get delegation until the instructor has checked:

- Your nameservers are all authoritative for your domain
- They all have the same SOA serial number
- The NS records within the zone match the list of servers you are requesting delegation for
- The slave(s) are not on the same desk as you

* Once you have delegation, try to resolve www.xxxxx.ws.nsrc.org.:

- On your own machine
- On someone else's machine (who is not slave for you)

* Add a new resource record to your zone file. Remember to update the serial number. Check that your slaves have updated. Try resolving this new name from elsewhere.

For instance, you could edit the file /etc/bind/org.nsrc.ws.xxxxxx and at the very bottom of the file add:

```
www2        IN      A       10.10.0.Y
```

Then restart bind and see if you can see the new A record.

```
# service bind9 restart
# dig www2.xxxxx.ws.nsrc.org
```