

DNS Exercise 3.1: Setting up a domain

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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/network/interfaces`

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

To fix this edit the file:

```
# vi /etc/network/interfaces
```

And, change the primary network interface definition so that it now looks like:

```
# The primary network interface
auto eth0
iface eth0 inet static
    address 10.10.0.XX
    gateway 10.10.0.254
    netmask 255.255.255.0
    network 10.10.0.0
    broadcast 10.10.0.255
    # virtio, bridging, dynamips and UDP checksum errors
```

```
post-up ethtool --offload eth0 tx off
```

Replace "XX" with your machine's address.

The next time your machine reboots it will no longer run the DHCP client. Now let's manually shutdown the DHCP client on your machine:

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

Note the Process ID (pid) of the dhclient process that is running. You will need this in order to shut down the client. To stop the client type:

```
# kill <ProcessID>
```

Finally, we need to make sure that your /etc/resolv.conf file has the correct entries. The DHCPCLIENT process overwrites this file each time it requests an IP address, which is fairly often.

Edit the file /etc/resolv.conf

```
# vi /etc/resolv.conf
```

And change the file to read:

```
nameserver 127.0.0.1
domain ws.nsrc.org
search ws.nsrc.org
```

Save the file and exit.

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.xxxxxx.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.X            ; 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 { 10.10.0.Y; };
};

```

Where "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.xxxxxx.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 { 10.10.0.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 +nored @10.10.0.X xxxxx.ws.nsrc.org. soa
# dig +nored @10.10.0.Y 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.X
```

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

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

