**You will install DNS on your 1st and 3rd Virtual Machine Make sure you have a domain name you can use that does not already exist.  You can check if it exists by using "whois" on**[**www.internic.org**](http://www.internic.org/)

**Connect to your Virtual Machines by:**

* Connecting the VPN Cisco AnyConnect Client (login in with your netid and neitd password
* ssh to 10.8.9.2 using putty or from a Mac type:  ssh -l ubuntu 10.8.9.2  (password is ubuntu)
* ssh to your virtual machine (i.e. ssh 192.168.1.xx, where xx is the last byte of your IP address)
* verify your on your virtual machine by typing ifconfig and then look for the IP address of your virtual machine

**Choose a domain name.  You can use your name or another name as long as you verify it does not already exist on the Internet.  Write the domain name down as you'll use it for the next steps.**

**DO NOT USE ANY IP ADDRESSES IN THIS LAB FOR YOUR CONFIGURATION.  YOU NEED TO USE YOUR OWN IP ADDRESSES FOR VM1 and VM3**

**After you're connected do the steps below.**

**Install the bind packages on VM1**  
  
1. sudo apt-get install bind9 bind9utils bind9-doc

This will install the DNS server software and several files in the /etc/bind directory that you will modify in later steps below.  
  
2. On VM1 modify the name of the hostname in /etc/hosts by typing:  
sudo vi /etc/hosts  
  
The host name you will use is ns1 for the primary name server (1st virtual machine) and ns2 for the secondary (3rd virtual machine, i.e. secondary server)  
  
ex. 192.168.1.11 ns1.netsci.com ns1 u3  (use your domain name in place of netsci.com and your own IP address)  
     192.168.1.103 ns2.netsci.com ns2 u4 (use your domain name in place of netsci.com and your own IP address)  
  
3.On VM1 edit the /etc/hostname file.

Type in ns1 on the 1st virtual machine using vi, nano or some other text editor.  After saving the file, read this value into the currently running system by typing:  
sudo vi /etc/hostname

sudo hostname -F /etc/hostname

To see the new name of your system you need to log out and log back in

4. On VM1 create the forward and reverse zone files  
  
sudo mkdir /etc/bind/zones

5. On VM1 copy the template files db.local and db.127 to the newly created /etc/bind/zones/ directory  
sudo cp /etc/bind/db.local /etc/bind/zones/db.netsci.com  (use your domain name in place of netsci.com)  
sudo cp /etc/bind/db.127 /etc/bind/zones/db.192.168.1

Modify the following files with your domain and IP info

|  |
| --- |
| 1. named.conf.local (located in /etc/bind/) 2. named.conf.options (located in /etc/bind/) 3. db.yourdomainname (located in /etc/bind/zones/) 4. db.192.168.1 (located in /etc/bind/zones/) 5. update the nameserver in your /etc/resolv.conf file |

See screenshots for details

**DNS 1 (VM1)**

**1. sudo nano /etc/bind/named.conf.local**

**2. sudo nano /etc/bind/named.conf.options**

**3. forward zone (db.yourdomain)**

**4. reverse zone (db.192.168.1)**

**5.**On VM1 make sure you put your nameserver in /etc/resolv.conf and comment out the other info.  You will assign the IP address of your 1st virtual machine to the hostname.  For example if your VM1 IP address is 192.168.1.11 you would add the following info to your /etc/resolv.conf file:  
nameserver 192.168.1.11

**DNS 2 (VM3)**

**Install the bind packages**  
  
1. sudo apt-get install bind9 bind9utils bind9-doc

This will install the DNS server software and several files in the /etc/bind directory that you will modify in later steps below.  
  
2. On VM3 modify the name of the hostname in /etc/hosts by typing:  
sudo vi /etc/hosts  
  
The host name you will use is ns2 for the secondary (3rd virtual machine, i.e. secondary server)  
  
ex.     192.168.1.11 ns1.netsci.com ns1 u3  (use your domain name in place of netsci.com)  
    192.168.1.103 ns2.netsci.com ns2 u4 (use your domain name in place of netsci.com)  
  
  
3. On VM3 edit the /etc/hostname file.

Type in ns2 on the 3rd virtual machine using vi, nano or some other text editor.  After saving the file, read this value into the currently running system by typing:  
  
sudo hostname -F /etc/hostname  
  
4. On VM3 create the forward and reverse zone files  
  
sudo mkdir /etc/bind/zones

5. On VM3 copy the template files db.local and db.127 to the newly created /etc/bind/zones/ directory

sudo cp /etc/bind/db.local /etc/bind/zones/db.netsci.bak (use your domain name in place of netsci.com)  
sudo cp /etc/bind/db.127 /etc/bind/zones/db.192.168.1.bak

Modify the following files with your domain and IP info

|  |
| --- |
| 1. named.conf.local 2. named.conf.options 3. db.yourdomainname 4. db. 192.168.1 5. update the nameserver in your /etc/resolv.conf file |

See screenshots below:

**1. sudo nano /etc/bind/named.conf.local**

**2. sudo nano /etc/bind/named.conf.options**

**3. Forward zone**

change the 1st line from ns1.netsci.com to ns2.yourdomain.com

change admin.netsci.com to admin.yourdomain.com

**4. Reverse zone**

change the 1st line from ns1.netsci.com to ns2.yourdomain.com

change admin.netsci.com to admin.yourdomain.com

under the PTR section at the bottom of the file make sure you use the last byte of your IP address.

For example, if your IP address for ns1 is 192.168.1.40 you would change the following line from

11    IN    PTR  ns1.netsci.com.

40    IN   PTR  your ns1 server

**3.**On VM3 make sure you put your nameserver in /etc/resolv.conf and comment out the other info.  You will assign the IP address of your 3rd virtual machine to the hostname.  For example if your VM3 IP address is 192.168.1.103 you would add the following info to your /etc/resolv.conf file:  
nameserver 192.168.1.103

**Testing and Restarting Bind**

Before we restart our service, we should test all of our configuration files to make sure that they're configured correctly. We have some tools that can check the syntax of each of our files.

First, we can check the named.conf.local and named.conf.options files by using the named-checkconf command. Since both of these files are source by the skeleton named.conf file, it will test the syntax of the files we modified.

**sudo named-checkconf**

If this returns without any messages, it means that the named.conf.local and named.conf.options files are syntactically valid.

Next, you can check your individual zone files by passing the domain that the zone handles and the zone file location to the named-checkzone command. So for our guide, you could check the forward zone file by typing:

**sudo named-checkzone netsci.com /etc/bind/zones/db.netsci.com**

If your file has no problems, it should tell you that it loaded the correct serial number and give the "OK" message;

zone netsci.com/IN: loaded serial 5

OK

If you run into any other messages, it means that you have a problem with your zone file. Usually, the message is quite descriptive about what portion is invalid.

You can check the reverse zone by passing the in-addr.arpa address and the file name. For our demonstration, we would be type this:

**sudo named-checkzone 1.168.192.in-addr.arpa /etc/bind/zones/db.192.168.1**

Again, this should give you a similar message about loading the correct serial number:

zone 1.168.192.in-addr.arpa/IN: loaded serial 5

OK

If all of your files are checking out, you can restart your Bind service:

**sudo service bind9 restart**

You should check the logs by typing:

sudo tail -f /var/log/syslog

Type ping www.netsci.com to see if you get a response.  Instead of [www.netsci.comLinks to an external site.](http://www.netsci.com/) you should use your domain name.

**What to hand in?**

Upload the following screen shots:

1. your forward and reverse zone files

2. nslookup host.domain name (where host is the name given to an IP address in your forward and reverse zone

3. nslookup the IP address for the host in step 2

4. Stop DNS on VM1 by typing

**sudo service bind9 stop**

5. Type nslookup [www.yourdomainname.com (Links to an external site.)](http://www.yourdomainname.com/)

What happens?

6. Log on to VM3

Stop DNS on VM3 by typing

**sudo service bind9 stop**

7. Start DNS on VM3 by typing

**sudo service bind9 start**

8. Log on to VM3 and type

nslookup [www.yourdomainname.com (Links to an external site.)](http://www.yourdomainname.com/)

What happens?

9. Log back on to VM1 and restart DNS by typing

**sudo service bind9 start**

10. Ensure DNS is working again on VM1 by typing

nslookup [www.yourdomainname.com](http://www.yourdomainname.com/)