PANGASINAN STATE UNIVERSITY
Urdaneta Campus, Urdaneta City Pangasinan
College of Engineering and Architecture
Computer Engineering Department

Elective 1 – Systems and Network Administration 1

Evaluation: Assignment 1 Score: _____
Topic: Setup DNS Server Date: February 27, 2024

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INSTRUCTIONS:

1. Setup any DNS server in your Virtual Machine using any linux distros of your choice.
2. Use your date of birth as the ip address of your server mm.dd.yy.1. If your birthday is June 12, 2007 then your web server's ip address should be 06.12.07.1.
3. Use appropriate subnet mask for your respective ip address.
4. Your domain should be your Given Name and Family name, no spaces as. If your name is Kenneth Oliver S. Lopez, the domain name for your DNS server should be kennethlopez.com
5. Test and make sure you can that your DNS server is working. When everything is working. Show to your instructor that everything is working properly by running nslookup
6. After physical checking, create and submit a step by step procedure how did you set up your mail server on the space provided below. Please make sure that when copying a screen shot of a terminal window, use white background and black foreground.

Setup DNS Server

Now, we are going to set up a DNS Server using Ubuntu Desktop. Setting up a DNS Server is not difficult; simply follow the step-by-step instructions below to create your own DNS Server using Ubuntu Desktop.

STEP 1: **Prepare your Ubuntu Desktop**.
Go to your VMware, open your Ubuntu Desktop, and then open its Terminal shell.

You need to update first your Ubuntu Desktop before we proceed the next step. To update your Ubuntu Desktop, use the command:

"sudo apt update"

STEP 2: **Install Bind9**. Bind9 is the one that we are going to use to setup the DNS server. To install this Bind9 use the command below:

"sudo apt install bind9"

```
erman09@ermancerujano: $ sudo apt install bind9
```

Then select "Y" (yes).

```
erman09@ermancerujano:~$ sudo apt install bind9
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bind9-utils
Suggested packages:
  bind-doc resolvconf
The following NEW packages will be installed:
  bind9 bind9-utils
0 upgraded, 2 newly installed, 0 to remove and 9 not upgraded.
Need to get 422 kB of archives.
After this operation, 1,663 kB of additional disk space will be used.
Do you want to continue? [Y/n] Y
```

Wait for it to download.

```
Setting up bind9 (1:9.18.18-0ubuntu0.22.04.2) ...
Adding group `bind' (GID 137) ...
Done.
Adding system user `bind' (UID 129) ...
Adding new user `bind' (UID 129) with group `bind' ...
Not creating home directory `/var/cache/bind'.
wrote key file "/etc/bind/rndc.key"
named-resolvconf.service is a disabled or a static unit, not starting it.
Created symlink /etc/systemd/system/bind9.service → /lib/systemd/system/named.se
rvice.
Created symlink /etc/systemd/system/multi-user.target.wants/named.service → /lib
/systemd/system/named.service.
Setting up bind9-host (1:9.18.18-0ubuntu0.22.04.2) ...
```

STEP 3: Setup static IP address

We are now going to set up the static IP address of our ubuntu desktop. The IP address that we are going to use is “3.24.3.1” and subnet mask will be “255.255.255.0” to change your IP address you need to use this command:

“vi /etc/network/interfaces”

```
erman09@ermancerujano:~$ vi /etc/network/interfaces
```

Then follow the configuration below:

```
source /etc/network/interfaces.d/**

auto lo
iface lo inet loopback

auto enp0s3
iface enp0s3 inet static
address 3.24.3.1
netmask 255.255.255.0
network 3.24.3.0
broadcast 3.24.3.255
gateway 3.24.3.2
```

Then save the configuration by following this esc >> type “:wq” >> Enter

You are now done configuring the static IP address of your Ubuntu Desktop.

STEP 4: Setup Fully Qualified Domain Name (FQDN)

We need to setup the fully qualified domain name (FQDN), but before we do that, we need to check first the hostname of your Ubuntu Desktop. To check the hostname of your ubuntu Desktop use the command below:

“hostname”

```
erman09@ermancerujano:~$ hostname
ermancerujano
```

Then setup the FQDP by opening the file “hosts.” To open the “hosts” file, use the command below:

“sudo vi /etc/hosts”

```
erman09@ermancerujano:~$ sudo vi /etc/hosts
```

Then follow the configuration below:

```
127.0.0.1       localhost
#127.0.1.1      ubuntuDesktop
3.24.3.1        ermancerujano.ermancerujano.com         ermancerujano

# The following lines are desirable for IPv6 capable hosts
::1     ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
3.24.3.1 ermancerujano.com

~
~
~
~
~
```

Then save the configuration by following this esc >> type “:wq” >> Enter

To check if you successfully configure the FDQN use the command below:

“hostname -f”

```
erman09@ermancerujano:~$ hostname -f
ermancerujano.ermancerujano.com
```

You now successfully set the FQDN.

STEP 5: Setup the DNS server.

To setup the DNS server, open the file “resolve.conf”. To open this file, use the command below:

```
erman09@ermancerujano:~$ sudo vi /etc/resolv.conf
```

Then follow the configuration below:

```
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs should typically not access this file directly, but only
# through the symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a
# different way, replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 3.24.3.1
search ermancerujano.com
```

Then save the configuration by following this esc >> type ":wq" >> Enter

STEP 6: Set the forwarders.

If the server fails to response to the query, that query will be transported into the forwarders. We will use the Google Public DNS server as our forwarders. To set the forwarders, we need to go to the bind directory by following the command below:

"cd /etc/bind"

Then check the lists of the directory by using the "ls" command.

```
erman09@ermancerujano:~$ cd /etc/bind
erman09@ermancerujano:/etc/bind$ ls
bind.keys  db.3                 name.conf.local           named.conf.local
db.0       db.empty             name.conf.options         named.conf.options
db.127     db.local             named.conf                rndc.key
db.255     ermancerujano.com.db  named.conf.default-zones  zones.rfc1918
```

Then configure the file "named.conf.options" by using the command:

"sudo vi named.conf.options"

```
erman09@ermancerujano:/etc/bind$ sudo vi named.conf.options
```

Then follow the configuration below:

```
options {
        directory "/var/cache/bind";

        // If there is a firewall between you and nameservers you want
        // to talk to, you may need to fix the firewall to allow multiple
        // ports to talk.  See http://www.kb.cert.org/vuls/id/800113

        // If your ISP provided one or more IP addresses for stable
        // nameservers, you probably want to use them as forwarders.
        // Uncomment the following block, and insert the addresses replacing
        // the all-0's placeholder.

        forwarders {
             8.8.8.8;
             8.8.4.4;
        };

        //========================================================================
```

Then save the configuration by following this esc >> type ":wq" >> Enter

We successfully added our forwarders.

STEP 7: Restart the DNS Server.

Before we start to test if the DNS Server is working or not. We need to restart it first. To restart your DNS server, just follow the command below:

```
erman09@ermancerujano:/etc/bind$ service bind9 restart
```

STEP 8: Test the DNS Server.

We need to test the DNS server that we setup to verify if it is working or not. To do that use the command below:

```
erman09@ermancerujano:~$ dig ubuntu.com
```

Then the result would be

```
;; Query time: 4996 msec
;; SERVER: 3.24.3.1#53(3.24.3.1) (UDP)
;; WHEN: Sun Feb 25 21:31:16 PST 2024
;; MSG SIZE  rcvd: 67
```

STEP 9: Create Forward Lookup Zones.

To create a forward lookup zones, we need to open the file "named.conf.local" in the bind directory. To open that use the command below:

"sudo vi /etc/bind/named.conf.local"

```
erman09@ermancerujano:~$ sudo vi /etc/bind/named.conf.local
```

Then follow the configuration below:

```
//
// Do any local configuration here
//

// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";

   zone "ermancerujano.com" {
        type master;
        file "/etc/bind/ermancerujano.com.db";

};

   zone "3.24.3.in-addr.arpa" {
        type master;
        file "/etc/bind/db.3";
};
```

Then save the configuration by following this esc >> type ":wq" >> Enter

STEP 10: Create the database file.

To create a database file, we need to go first in the bind directory. To go to the bind directory, use the command below:

"cd /etc/bind"

```
erman09@ermancerujano:~$ cd /etc/bind
```

Then use the command "ls" to show the content of this directory.

```
erman09@ermancerujano:/etc/bind$ ls
bind.keys  db.255    name.conf.local    named.conf.default-zones  rndc.key
db.0       db.empty  name.conf.options  named.conf.local          zones.rfc1918
db.127     db.local  named.conf         named.conf.options
```

Then create a copy of db.local file with the filename that you enter to your zone which is "ermancerujano.com"

```
erman09@ermancerujano:/etc/bind$ ls
bind.keys  db.255    name.conf.local    named.conf.default-zones  rndc.key
db.0       db.empty  name.conf.options  named.conf.local          zones.rfc1918
db.127     db.local  named.conf         named.conf.options
erman09@ermancerujano:/etc/bind$ sudo cp db.local ermancerujano.com.db
```

Then open this file (ermancerujano.com.db).

```
erman09@ermancerujano:/etc/bind$ sudo vi  ermancerujano.com.db
```

Then follow the configuration below to your ermancerujano.com.db:

```
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     ermancerujano.ermancerujano.com.  root.ermancerujano.com
. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ermancerujano.com.
@       IN      A       3.24.3.1
www     IN      A       3.24.3.1
~
~
~
~
```

Then save the configuration by following this esc >> type ":wq" >> Enter

Create the second database. Just copy the ermancerujano.com.db and name it db.3 (this what we set in the zone) by following the command below:

```
erman09@ermancerujano:/etc/bind$ sudo cp ermancerujano.com.db db.3
```

Then open the db.3 file using the command below:

```
erman09@ermancerujano:/etc/bind$ sudo cp vi db.3
```

Follow the configuration below for db.3:

```
;
; BIND data file for local loopback interface
;
$TTL    604800
@       IN      SOA     ermancerujano.ermancerujano.com.  root.ermancerujano.com
. (
                              2         ; Serial
                         604800         ; Refresh
                          86400         ; Retry
                        2419200         ; Expire
                         604800 )       ; Negative Cache TTL
;
@       IN      NS      ermancerujano.com
1       IN      PTR     www.ermancerujano.com

~
~
~
~
```

Then save the configuration by following this esc >> type ":wq" >> Enter

STEP 11: Restart your DNS server.

We need to restart again our DNS server by using the command below:

```
erman09@ermancerujano:~$ service bind9 restart
```

STEP 12: Check the status of your DNS server.

To check the status of your DNS server, follow the command below:

"service bind9 status"

```
erman09@ermancerujano:~$ service bind9 status
```

The result should be:

```
erman09@ermancerujano:~$ service bind9 status
● named.service - BIND Domain Name Server
     Loaded: loaded (/lib/systemd/system/named.service; enabled; vendor preset
     Active: active (running) since Sun 2024-02-25 21:24:35 PST; 29min ago
       Docs: man:named(8)
    Process: 3189 ExecStart=/usr/sbin/named $OPTIONS (code=exited, status=0/SU
   Main PID: 3193 (named)
      Tasks: 14 (limit: 19048)
     Memory: 7.7M
        CPU: 3.202s
     CGroup: /system.slice/named.service
             └─3193 /usr/sbin/named -u bind
```

STEP 13: Try the DNS server.

Go to the nslookup using the command below:

"nslookup"

```
erman09@ermancerujano:~$ nslookup
> set type=any
> ermancerujano.com
;; Connection to 3.24.3.1#53(3.24.3.1) for ermancerujano.com failed: ti
med out.
Server:         3.24.3.1
Address:        3.24.3.1#53

ermancerujano.com
        origin = ermancerujano.ermancerujano.com
        mail addr = root.ermancerujano.com
        serial = 2
        refresh = 604800
        retry = 86400
        expire = 2419200
        minimum = 604800
ermancerujano.com       nameserver = ermancerujano.com.
Name:   ermancerujano.com
Address: 3.24.3.1
```

```
Address: 3.24.3.1
> 3.24.3.1
Server:         3.24.3.1
Address:        3.24.3.1#53

1.3.24.3.in-addr.arpa   name = www.ermancerujano.com.3.24.3.in-addr.arp
a.
>
```

As you can see, we successfully setup our DNS Server.