LAB: nameserver (DNS)

Lab Environment

The workshop WiFi:

- SSID: `workshop`
- PASS: `iij/2497`

Hosts - Virtual machines (Ubuntu 18.04LTS/LXC)

- Hostname: `nsXX.workshop`
- IPv6: `fd00:2497:1::X`
- IPv4: `10.0.0.X`

Where `x` and `XX` is yoru group ID. For group 1, hostname is `ns01.workshop`, IPv6 address is `fd00:2497:1::1`, and IPv4 is `10.0.0.1`.

Domain names

- `groupXX.workshop`

Where `x` and `XX` is yoru group ID. For group 1, domain name is `group01.workshop`.

Install and configure bind9

`ssh` to your virtual server and install bind9.

```
$ sudo apt install bind9
```

> Note: The sudo password is `iij/2497`

Open `/etc/bind/named.conf.options` to modify options.

```
$ sudo vi /etc/bind/named.conf.options
```

Update the lines in the `options` secion like below.

```
options {
...
        recursion no;
};
```

The above configuration disables DNSSEC verification and make your nameserver act as an authoritative only server.

Open `/etc/bind/name.conf.local` to add your domain configuration.

```
$ sudo vi /etc/bind/named.conf.local
```

Add the following configuration.

```
zone "groupXX.workshop" {
    type master;
    file "/etc/bind/groupXX.workshop";
};
```

> Note: `XX` is your group ID.

Create a zone file.

```
$ sudo vi /etc/bind/groupXX.workshop
```

> Note: The filename must be exactly same as you specified in the `named.conf.local` file.

```
$TTL 300
@ IN SOA nsXX.workshop root.groupXX.workshop (
           1     ; Serial
      604800     ; Refresh
       86400     ; Retry
     2419200     ; Expire
         300     ; Negative Cache TTL
    )

@ IN NS nsXX.workshop.
nsXX.workshop. IN A    10.0.0.X
nsXX.workshop. IN AAAA fd00:2497:1::X
```

> Note: We configure the default valid lifetime for each record and negative cache lifetime rather small values for handson, however you may need to use logner values.

Restart the bind9 service.

```
sudo systemctl restart bind9
```

Check the bind9 service status by `rndc` and `systemctl` commands.

```
$ sudo rndc status
```

It should output something like.

```
version: BIND 9.11.3-1ubuntu1.3-Ubuntu (Extended Support Version) <id:a375815>
running on ns01: Linux x86_64 4.15.0-45-generic #48-Ubuntu SMP Tue Jan 29 16:28:13
 UTC 2019
boot time: Tue, 19 Feb 2019 02:50:56 GMT
last configured: Tue, 19 Feb 2019 02:58:59 GMT
configuration file: /etc/bind/named.conf
CPUs found: 8
worker threads: 8
UDP listeners per interface: 7
number of zones: 6 (0 automatic)
debug level: 0
xfers running: 0
xfers deferred: 0
soa queries in progress: 0
query logging is OFF
recursive clients: 0/900/1000
tcp clients: 0/150
server is up and running
```

If you use `systemctl`,

```
$ sudo systemctl status bind9
```

then you will get something like below.

```
tcp clients: 0/150
server is up and running
root@ns01:~# systemctl status bind9
● bind9.service - BIND Domain Name Server
   Loaded: loaded (/lib/systemd/system/bind9.service; enabled; ve
   Active: active (running) since Tue 2019-02-19 02:50:56 UTC; 59
     Docs: man:named(8)
 Main PID: 3823 (named)
    Tasks: 11 (limit: 4915)
   CGroup: /system.slice/bind9.service
           └─3823 /usr/sbin/named -f -u bind

(blah, blah)
```

Check your domain information with the `dig` command.

```
$ dig groupXX.workshop @localhost
```

And check if you receive the following information in the output.

```
;; AUTHORITY SECTION:
groupXX.workshop.    300 IN  SOA nsXX.workshop. root.groupXX.workshop. 1 604800 864
00 2419200 300
```

Add `A` record (IPv4)

Add the following line at the bottom of your db file (`/etc/bind/groupXX.workshop`).

```
ping.groupXX.workshop. IN A 10.0.0.X
```

Also, increment the serial number from `1` to `2` .

Reload the updated database.

```
$ sudo rndc reload groupXX.workshop
```

Test if the new name is registered by the `ping` command.

```
$ ping ping.groupXX.workshop
```

Add `AAAA` record (IPv6)

Add the following line at the bottom of your db file (`/etc/bind/groupXX.workshop`).

```
ping.groupXX.workshop. IN AAAA fd00:2497:1::X
PING ping.groupXX.workshop (10.0.0.X) 56(84) bytes of data.
64 bytes from 10.0.0.X (10.0.0.X): icmp_seq=1 ttl=64 time=0.015 ms
64 bytes from 10.0.0.X (10.0.0.X): icmp_seq=2 ttl=64 time=0.088 ms
```

Also, increment the serial number from `2` to `3` (or whatever value appropriate).

Reload the updated database.

```
$ sudo rndc reload groupXX.workshop
```

Test if the new name is registered by the `ping6` command.

```
$ ping6 ping.groupXX.workshop
PING ping.groupXX.workshop(fd00:2497:1::X (fd00:2497:1::X)) 56 data bytes
64 bytes from fd00:2497:1::X (fd00:2497:1::X): icmp_seq=1 ttl=64 time=0.028 ms
64 bytes from fd00:2497:1::X (fd00:2497:1::X): icmp_seq=2 ttl=64 time=0.098 ms
```