



[Domain Name System](#) (DNS) is the root of the internet that translates the domain name to IP Address and vice versa. BIND9 (Berkeley Internet Name Domain) package provides the functionality of the name to IP conversion.

This post will guide you to configure [DNS server](#) on [Ubuntu 18.04](#) / [Ubuntu 16.04](#).

Environment

Domain Name: itzgeek.local		
ns1.itzgeek.local	192.168.0.10	Master DNS Server

Setup DNS Server on Ubuntu 18.04 / Ubuntu 16.04

Prerequisites

Update the repository index.

```
sudo apt update
```

Make sure the DNS server has a static IP address.

READ: [How to configure static IP address in Ubuntu 18.04 / Ubuntu 16.04 using ifupdown](#)

If you are using **Netplan** – a new network tool for configuring networking in [Ubuntu 18.04](#), then.

READ: [How To Configure Static IP Address in Ubuntu 18.04 using Netplan](#)

Install DNS Server

The package name for the DNS server on Ubuntu is `bind9` and is available in the base repository. Use the `apt` command to install the `bind9` package.

```
sudo apt install -y bind9 bind9utils bind9-doc dnsutils
```

Configure DNS Server

The `/etc/bind/` directory is the main configuration directory of the DNS server, and it holds configuration files and zone lookup files.

Global configuration file is `/etc/bind/named.conf`. You should not use this file for your local DNS zone rather you can use `/etc/bind/named.conf.local` file.

Create Zones

Let us begin by creating a forward zone for your domain.

```
sudo nano /etc/bind/named.conf.local
```

Forward Zone

The following is the forward zone entry for the `itzgeek.local` domain in the `named.conf.local` file.

```
zone "itzgeek.local" IN { // Domain name
    type master; // Primary DNS
    file "/etc/bind/forward.itzgeek.local.db"; // Forward lookup file
    allow-update { none; }; // Since this is the primary DNS, it should be
    none.
};
```

Reverse Zone

The following entries are for the reverse zone in the `named.conf.local` file.

```
zone "0.168.192.in-addr.arpa" IN { //Reverse lookup name, should match your
network in reverse order
    type master; // Primary DNS
```

```
file "/etc/bind/reverse.itzgeek.local.db"; //Reverse lookup file

allow-update { none; }; //Since this is the primary DNS, it should be n
one.

};
```

Create Zone lookup file

Once you create zones, you can go ahead and create zone data files that hold DNS records for the forward zone and reverse zone.

Forward Zone lookup file

Copy the sample entries to zone file called `forward.itzgeek.local.db` for the forward zone under `/etc/bind` directory.

Record types in the zone file,

SOA – Start of Authority

NS – Name Server

A – A record

MX – Mail for Exchange

CN – Canonical Name

Domain names should end with a dot (.).

```
sudo cp /etc/bind/db.local /etc/bind/forward.itzgeek.local.db
```

Edit the zone.

```
sudo nano /etc/bind/forward.itzgeek.local.db
```

Update the content shown below.

Whenever you change any records in the lookup file, make sure you update the serial number to some random number, higher than current.

```
$TTL      604800
@         IN      SOA      ns1.itzgeek.local. root.itzgeek.local. (
                        3          ; Serial
                        604800    ; Refresh
                        86400     ; Retry
                        2419200   ; Expire
                        604800 )   ; Negative Cache TTL
;
;@        IN      NS       localhost.
;@        IN      A        127.0.0.1
;@        IN      AAAA     ::1

;Name Server Information
@         IN      NS       ns1.itzgeek.local.
```

```

;IP address of Name Server
ns1      IN      A      192.168.0.10
;Mail Exchanger
itzgeek.local.  IN      MX      10      mail.itzgeek.local.
;A - Record HostName To Ip Address
www      IN      A      192.168.0.100
mail     IN      A      192.168.0.150
;CNAME record
ftp      IN      CNAME   www.itzgeek.local.

```

Reverse Zone lookup file

Copy the sample entries to the zone file called `reverse.itzgeek.local.db` for the reverse zone under `/etc/bind` directory and create reverse pointers for the above forward zone records.

PTR – Pointer

SOA – Start of Authority

```
sudo cp /etc/bind/db.127 /etc/bind/reverse.itzgeek.local.db
```

Edit the reverse zone file.

```
sudo nano /etc/bind/reverse.itzgeek.local.db
```

Update the content shown below.

Whenever you change any DNS records in the lookup file, make sure to update the serial number to some random number, higher than the current one.

```

$TTL      604800
@         IN      SOA      itzgeek.local. root.itzgeek.local. (
                        3          ; Serial
                        604800     ; Refresh
                        86400      ; Retry
                        2419200    ; Expire
                        604800 )   ; Negative Cache TTL
;
;@        IN      NS      localhost.
;1.0.0    IN      PTR     localhost.

;Name Server Information
@         IN      NS      ns1.itzgeek.local.

;Reverse lookup for Name Server

```

```
10      IN      PTR      ns1.itzgeek.local.
;PTR Record IP address to HostName
100     IN      PTR      www.itzgeek.local.
150     IN      PTR      mail.itzgeek.local.
```

Check BIND Configuration Syntax

Use `named-checkconf` command to check the syntax and `named.conf*` files for any errors.

```
sudo named-checkconf
```

Command will return to the shell if there are no errors.

Also, you can use `named-checkzone` to check the syntax errors in zone files.

Forward zone

```
sudo named-checkzone itzgeek.local /etc/bind/forward.itzgeek.local.db
```

Output:

```
zone itzgeek.local/IN: loaded serial 3
OK
```

Reverse zone

```
named-checkzone 0.168.192.in-addr.arpa /etc/bind/reverse.itzgeek.local.db
```

Output:

```
zone 0.168.192.in-addr.arpa/IN: loaded serial 3
OK
```

Restart bind service.

```
sudo systemctl restart bind9
```

Enable it on system startup.

```
sudo systemctl enable bind9
```

Check the status of the bind9 service.

```
sudo systemctl status bind9
```

DNS Record Update

Whenever you change a DNS record, do not forget to change the serial number in the zone file and reload the zone.

Change `itzgeek.local` & `0.168.192.in-addr.arpa` with your zone names.

```
### Forward Zone ###  
sudo rndc reload itzgeek.local  
  
### Reverse Zone ###  
sudo rndc reload 0.168.192.in-addr.arpa
```

Verify DNS Server

Go to any client machine and add our new DNS server IP Address in `/etc/resolv.conf` file.

```
sudo nano /etc/resolv.conf
```

Make an entry like below.

```
nameserver 192.168.0.10
```

OR

Read the below tutorial to set DNS server IP in Linux.

READ: [How to Set DNS IP address in CentOS / Fedora](#)

READ: [How to Set DNS IP address in Ubuntu / Debian – ifupdown](#)

READ: [How To Set DNS IP Address in Ubuntu 18.04 – Netplan](#)

Use the dig command to check the forward zone.

```
dig www.itzgeek.local
```

If you get command not found, then install the `bind-utils` package.

Output:

```
; <<>> DiG 9.10.3-P4-Ubuntu <<>> www.itzgeek.local  
;; global options: +cmd  
;; Got answer:  
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 18022  
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2  
  
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags;; udp: 4096  
;; QUESTION SECTION:  
;www.itzgeek.local.          IN      A  
  
;; ANSWER SECTION:  
www.itzgeek.local.         604800 IN      A      192.168.0.100  
  
;; AUTHORITY SECTION:  
itzgeek.local.            604800 IN      NS     ns1.itzgeek.local.
```

```
;; ADDITIONAL SECTION:
ns1.itzgeek.local.      604800  IN      A       192.168.0.10

;; Query time: 0 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Dec 30 12:42:18 EST 2019
;; MSG SIZE rcvd: 96
```

The DNS server's answer for the forward lookup: 192.168.0.100 as IP address for www.itzgeek.local.

Confirm the reverse lookup with dig command.

```
dig -x 192.168.0.100
```

Output:

```
; <<>> DiG 9.10.3-P4-Ubuntu <<>> -x 192.168.0.100
;; global options: +cmd
;; Got answer:
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 37122
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;100.0.168.192.in-addr.arpa.      IN      PTR

;; ANSWER SECTION:
100.0.168.192.in-addr.arpa. 604800 IN      PTR      www.itzgeek.local.

;; AUTHORITY SECTION:
0.168.192.in-addr.arpa. 604800 IN      NS       ns1.itzgeek.local.

;; ADDITIONAL SECTION:
ns1.itzgeek.local.      604800  IN      A       192.168.0.10

;; Query time: 0 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Mon Dec 30 12:43:20 EST 2019
;; MSG SIZE rcvd: 120
```

The DNS server's answer for reverse lookup: www.itzgeek.local as a name for 192.168.0.100.

This result confirms that both zone lookups are working fine.

Conclusion

That's All. You now have successfully configured DNS server on [Ubuntu 18.04](#) / [Ubuntu 16.04](#) as the master server. In our next post, we will configure a [slave DNS server on Ubuntu 18.04 / Ubuntu 16.04](#).