

## Lab experiment 2: Install and configure DNS

### **AIM:**

To create and configure DNS Server

### **DESCRIPTION:**

DNS Server

A DNS server is a computer server that contains a database of public IP addresses and their associated hostnames, and in most cases, serves to resolve, or translate, those common names to IP addresses as requested.

**Port No:** 53

**Package name:** bind9

**Configuration file:** /etc/bind/named.conf. (Primary configuration file),/etc/bind/db.root (root nameservers)

### **PROCEDURE:**

#### CASHING NAMESERVER

When configured as a caching nameserver BIND9 will find the answer to name queries and

remember the answer when the domain is queried again.

1. Install bind9 by typing

```
$sudo apt install bind9
```

```
$sudo apt install dnsutils
```

2.The default configuration is set up to act as a caching server. All that is required is simply

adding the IP Addresses of your ISP's DNS servers. Simply uncomment and edit the following in /etc/bind/named.conf.options:

3.Restart it by typing

```
$sudo systemctl restart bind9.service
```

## PRIMARY MASTER

As a primary master server BIND9 reads the data for a zone from a file on it's host and is authoritative for that zone.

### Forward zone file

To add a DNS zone to BIND9, turning BIND9 into a Primary Master server, the first step is to edit /etc/bind/named.conf.local:

```
$sudo cp /etc/bind/db.local /etc/bind/db.example.com
```

```
$sudo systemctl restart bind9.service
```

### Reverse Zone File

Now that the zone is set up and resolving names to IP Addresses, a *Reverse zone* needs to be added to allows DNS to resolve an address to a name.

1. Edit /etc/bind/named.conf.local

2. Now create the /etc/bind/db.192 file:

```
$sudo cp /etc/bind/db.127 /etc/bind/db.192
```

3. edit /etc/bind/db.192 changing the basically the same options as /etc/bind/db.example.com:

4.After creating the reverse zone file restart BIND9:

```
$sudo systemctl restart bind9.service
```

5.Check the status

```
$Sudo service bind9 status
```

6.Check if nslookup can resolve

```
$nslookup ftp.example.com
```

```
$nslookup ubuntu.example.com
```

7.Gather information about your DNS server

```
$dig ubuntu.example.com
```

```
$dig www.example.com
```

```
$dig ftp.example.com
```

# RESULT:

```
File Actions Edit View Help

(kali@kali)-[~]
$ sudo apt install bind9
bind9 is already the newest version (1:9.20.1-1).
The following packages were automatically installed and are no longer required:
  libavfilter9 libgeos3.12.1f64 libjxl0.7 libplacebo338 libpostproc57 libre2-10 libsvtav1enc1d1 libx265-199 openjdk-17-jre-headless python3-mistune0 python3-pytzdata rwho samba-dsdb-modules
  libdaxctl1 libjsonepp25 libndctl6 libpmem1 librav1e0 libroc0.3 libzfp-udev openjdk-17-jre python3-diskcache python3-pendulum rwho samba-ad-provision
Use 'sudo apt autoremove' to remove them.

Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 3
(kali@kali)-[~]
$
```

```
File Actions Edit View Help

(kali@kali)-[~]
$ sudo apt install bind9
bind9 is already the newest version (1:9.20.1-1).
The following packages were automatically installed and are no longer required:
  libavfilter9 libgeos3.12.1f64 libjxl0.7 libplacebo338 libpostproc57 libre2-10 libsvtav1enc1d1 libx265-199 openjdk-17-jre-headless python3-mistune0 python3-pytzdata rwho samba-dsdb-modules
  libdaxctl1 libjsonepp25 libndctl6 libpmem1 librav1e0 libroc0.3 libzfp-udev openjdk-17-jre python3-diskcache python3-pendulum rwho samba-ad-provision
Use 'sudo apt autoremove' to remove them.

Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 3
(kali@kali)-[~]
$ sudo apt install dnsmutils
dnsmutils is already the newest version (1:9.20.1-1).
The following packages were automatically installed and are no longer required:
  libavfilter9 libgeos3.12.1f64 libjxl0.7 libplacebo338 libpostproc57 libre2-10 libsvtav1enc1d1 libx265-199 openjdk-17-jre-headless python3-mistune0 python3-pytzdata rwho samba-dsdb-modules
  libdaxctl1 libjsonepp25 libndctl6 libpmem1 librav1e0 libroc0.3 libzfp-udev openjdk-17-jre python3-diskcache python3-pendulum rwho samba-ad-provision
Use 'sudo apt autoremove' to remove them.

Summary:
  Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 3
(kali@kali)-[~]
$ sudo systemctl restart bind9
Failed to restart bind9.service: Unit bind9.service not found.
(kali@kali)-[~]
$ sudo systemctl restart named
(kali@kali)-[~]
$
```

```
File Actions Edit View Help
Use 'sudo apt autoremove' to remove them.

Summary:
Upgrading: 0, Installing: 0, Removing: 0, Not Upgrading: 3

[kali@kali:~]$ sudo systemctl restart bind9
Failed to restart bind9.service: Unit bind9.service not found.

[kali@kali:~]$ sudo systemctl restart named

[kali@kali:~]$ sudo apt install bind9.service
Error: Unable to locate package bind9.service
Error: Couldn't find any package by glob 'bind9.service'

[kali@kali:~]$ sudo systemctl status named
sudo: systemctl: command not found

[kali@kali:~]$ sudo systemctl status named
● named.service - BIND Domain Name Server
   Loaded: loaded (/usr/lib/systemd/system/named.service; disabled; preset: disabled)
   Active: active (running) since Tue 2024-09-10 00:26:58 EDT; 47s ago
     Docs: man:named(8)
    Main PID: 10723 (named)
      Status: "running"
        Task: 8 (limit: 2268)
     Memory: 33.4M (peak: 33.6M)
          CPU: 36ms
    CGroup: /system.slice/named.service
            └─10723 /usr/sbin/named -f -u bind

Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:2d::d#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:dc3::35#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:dc3::35#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:12::d0#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:12::d0#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53#53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53#53
Sep 10 00:26:59 kali named[10723]: managed-keys-zone: Initializing automatic trust anchor management for zone '.': DNSKEY ID 20326 is now trusted, waiving the normal 30-day waiting period.

[kali@kali:~]$ sudo nano /etc/bind/named.conf.options
[kali@kali:~]$
```

```
File Actions Edit View Help
GNU nano 3.1 /etc/bind/named.conf.options
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/800223

    // 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 {
        10.0.2.15;
    };

    // If BIND logs error messages about the root key being expired,
    // you will need to update your keys.  See https://www.isc.org/bind-keys

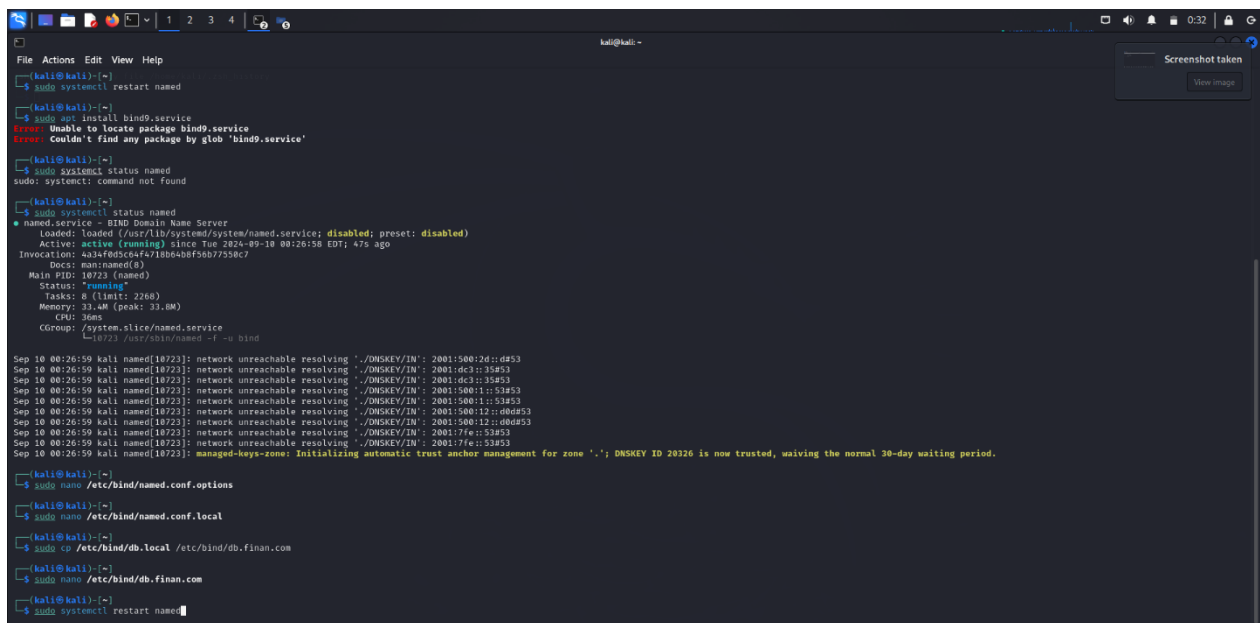
    dnssec-validation auto;

    listen-on-v6 { any; };
};

Help      Write Out  Where Is  Cut       Execute   Location  Read 26 lines  Set Mark  To Bracket  Previous  Back  Prev Word  Home
Exit      Read File   Replace  Paste    Justify   Go To Line  Redo    Copy       Where Was  Next     Forward  Next Word  End
```

```
GNU nano 0.1 /etc/bind/named.conf.local
// Do any local configuration here
//
// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
//forward zone
zone "finan.com" IN {
    type master;
    file "/etc/bind/db.finan.com";
};
```

```
GNU nano 0.1 /etc/bind/db.finan.com
; BIND data file for local loopback interface
;
$TTL 604800
@ IN SOA finan.com. root.finan.com. (
    2 ; Serial
    604800 ; Refresh
    86400 ; Retry
    2419200 ; Expire
    604800 ) ; Negative Cache TTL
;
@ IN NS finan.com.
@ IN A 10.0.2.33
@ IN AAAA ::1
```



```
File Actions Edit View Help
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:dc3::53a53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53a53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53a53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:12::00053
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:500:12::00053
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53a53
Sep 10 00:26:59 kali named[10723]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53a53
Sep 10 00:26:59 kali named[10723]: managed-keys-zone: Initializing automatic trust anchor management for zone '.': DNSKEY ID 20326 is now trusted, waiving the normal 30-day waiting period.
Sep 10 00:26:59 kali named[10723]: managed-keys-zone: managed-keys-zone: Initializing automatic trust anchor management for zone '.': DNSKEY ID 20326 is now trusted, waiving the normal 30-day waiting period.

(kali@kali)-[~]
$ sudo nano /etc/bind/named.conf.options
(kali@kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali@kali)-[~]
$ sudo cp /etc/bind/db.local /etc/bind/db.finan.com
(kali@kali)-[~]
$ sudo nano /etc/bind/db.finan.com
(kali@kali)-[~]
$ sudo systemctl restart named
(kali@kali)-[~]
$ nslookup finan.com
Server:      192.168.89.117
Address:     192.168.89.117#53
Non-authoritative answer:
** Can't find finan.com: No answer

(kali@kali)-[~]
$ sudo nano /etc/resolv.conf
(kali@kali)-[~]
$ sudo systemctl restart named
(kali@kali)-[~]
$ nslookup finan.com
Server:      10.0.2.15
Address:     10.0.2.15#53
Name:        finan.com
Address: 10.0.2.33
Name:        finan.com
Address: ::1

(kali@kali)-[~]
```

```
File Actions Edit View Help
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:9f::42a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:1b8:10::b4a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:1b8:10::b4a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fd::1a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fd::1a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53a53
Sep 10 06:13:46 kali named[1731]: managed-keys-zone: Key 20326 for zone . is now trusted (acceptance timer complete)
Sep 10 06:13:46 kali named[1731]: managed-keys-zone: Key 20326 for zone . is now trusted (acceptance timer complete)

(kali@kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali@kali)-[~]
$ sudo systemctl status bind9
● named.service - BIND Domain Name Server
   Loaded: loaded (/usr/lib/systemd/system/named.service; enabled; preset: disabled)
   Active: active (running) since Tue 2024-09-10 06:13:41 EDT; 53s ago
     Invocation: f4517a72155848eabdc4c5807ab0801
       CGroup: main/named(0)
             Main PID: 1731 (named)
             Status: "running"
             Tasks: 8 (limit: 2268)
             Memory: 31.4M (peak: 31.7M)
             CPU: 46ms
             CGROUP: /system.slice/named.service
             └─1731 /usr/sbin/named -f -u bind

Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:9f::42a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:1b8:10::b4a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:1b8:10::b4a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fd::1a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fd::1a53
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53a53
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Sep 10 06:13:46 kali named[1731]: managed-keys-zone: Key 20326 for zone . is now trusted (acceptance timer complete)
Sep 10 06:13:46 kali named[1731]: managed-keys-zone: Key 20326 for zone . is now trusted (acceptance timer complete)

(kali@kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali@kali)-[~]
$ sudo nano /etc/bind/db-2.0.10
(kali@kali)-[~]
$ sudo nano /etc/bind/db-2.0.10
(kali@kali)-[~]
$ sudo systemctl status bind9
```

```
GNU nano 0.1 /etc/bind/named.conf.local
// Do any local configuration here
//
// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
//forward zone
zone "finan.com" IN[
    type master;
    file "/etc/bind/db.finan.com";
};
//reverse zone
zone "2.0.10.in-addr.arpa" IN[
    type master;
    file "/etc/bind/db.2.0.10";
};
```

```
GNU nano 0.1 /etc/bind/db.2.0.10
; BIND reverse data file for local loopback interface
$TTL 604800
@ IN SOA finan.com. root.finan.com. (
    1          ; Serial
    604800     ; Refresh
    604800     ; Retry
    2419200    ; Expire
    604800 )   ; Negative Cache TTL
;
@ IN NS      finan.com.
33 IN PTR    dr.finan.com.
```



```
File Actions Edit View Help
● named.service - BIND Domain Name Server
   loaded: loaded (/usr/lib/systemd/system/named.service; enabled; preset: disabled)
   Active: active (running) since Tue 2024-09-10 06:13:41 EDT; 53s ago
     Invocation: f4517a72150480eab0c5087ab0801
       DocId: man:named(8)
     Main PID: 1731 (named)
       Status: "running"
         Tasks: 8 (limit: 2268)
       Memory: 31.4M (peak: 31.7M)
         CPU: 46ms
       CGroup: /system.slice/named.service
               └─1731 /usr/sbin/named -f -u bind

Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:9f::42853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2801:108:10::b853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2801:108:10::b853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fd::1853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fd::1853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:1::53853
Sep 10 06:13:46 kali named[1731]: managed-keys-zone: Key 20326 for zone . is now trusted (acceptance timer complete)

[kali@kali:~]$ sudo nano /etc/bind/named.conf.local
[kali@kali:~]$ sudo nano /etc/bind/db.2.0.10
[kali@kali:~]$ sudo nano /etc/bind/db.2.0.10
[kali@kali:~]$ sudo systemctl restart bind9
[kali@kali:~]$ nslookup 10.0.2.33
;; communications error to 8.8.8.8#53: timed out
;; communications error to 8.8.8.8#53: timed out
^X^Z
zsh: suspended nslookup 10.0.2.33

[kali@kali:~]$ sudo /etc/resolv.conf
sudo: /etc/resolv.conf: command not found
[kali@kali:~]$ sudo nano /etc/resolv.conf
[kali@kali:~]$
```

```
File Actions Edit View Help
Memory: 31.4M (peak: 31.7M)
CPU: 46ms
CGroup: /system.slice/named.service
        └─1731 /usr/sbin/named -f -u bind

Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:500:9f::42853
Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2801:108:10::b853
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Sep 10 06:13:42 kali named[1731]: network unreachable resolving './DNSKEY/IN': 2001:7fe::53853
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Sep 10 06:13:46 kali named[1731]: managed-keys-zone: Key 20326 for zone . is now trusted (acceptance timer complete)

[kali@kali:~]$ sudo nano /etc/bind/named.conf.local
[kali@kali:~]$ sudo nano /etc/bind/db.2.0.10
[kali@kali:~]$ sudo nano /etc/bind/db.2.0.10
[kali@kali:~]$ sudo systemctl restart bind9
[kali@kali:~]$ nslookup 10.0.2.33
;; communications error to 8.8.8.8#53: timed out
;; communications error to 8.8.8.8#53: timed out
^X^Z
zsh: suspended nslookup 10.0.2.33

[kali@kali:~]$ sudo /etc/resolv.conf
sudo: /etc/resolv.conf: command not found
[kali@kali:~]$ sudo nano /etc/resolv.conf
[kali@kali:~]$ sudo systemctl restart bind9
[kali@kali:~]$ nslookup 10.0.2.33
33.2.0.10.in-addr.arpa name = dr.finan.com.
[kali@kali:~]$
```

All the commands have been executed and the output has been obtained successfully.