DNS

Experiment: 2

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 firststep 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.192changing 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

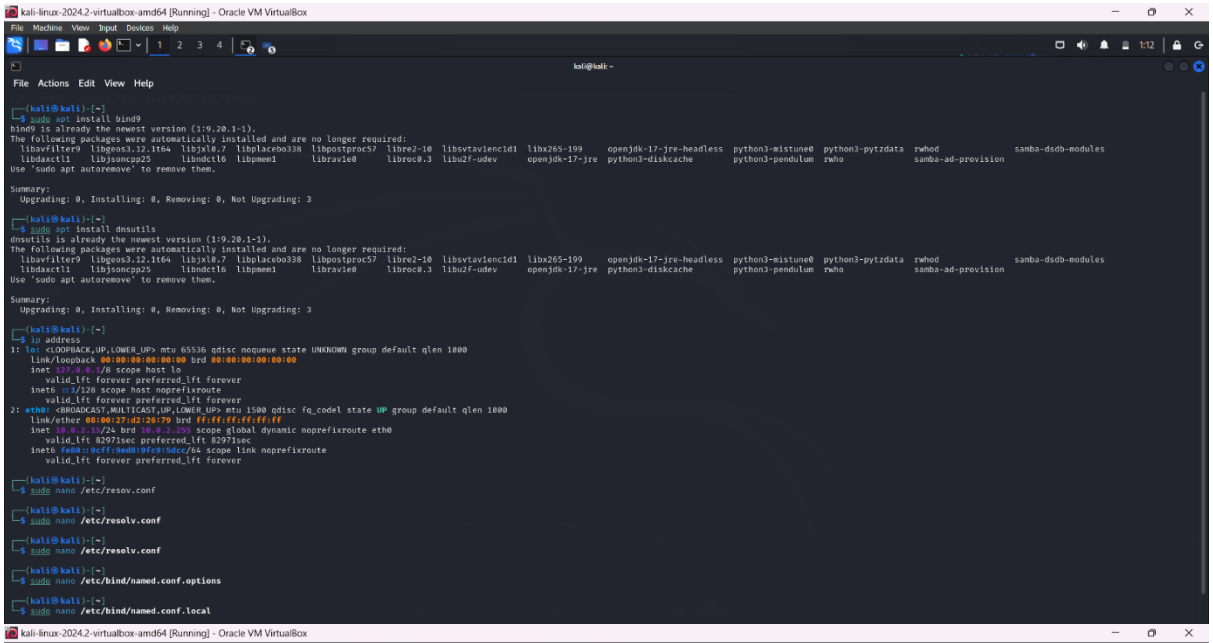
7. Gather information about your DNS server

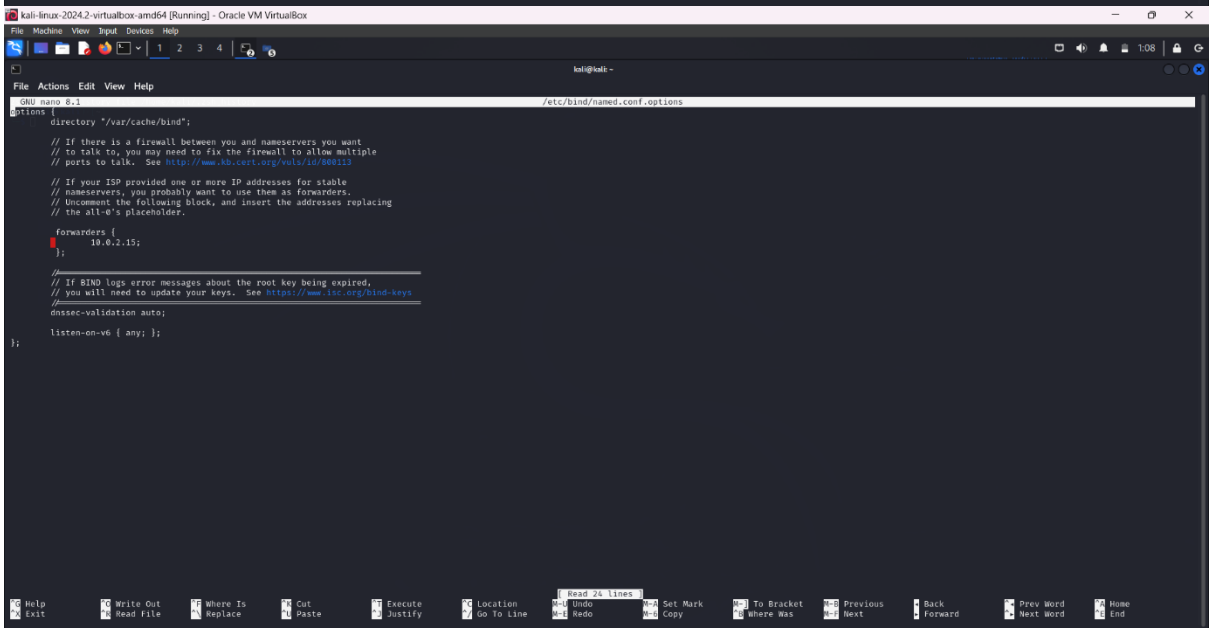
$dig ubuntu.example.com

$dig www.example.com

$dig ftp.example.com

Result:


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
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 libgeos3.12.1t64 libjxl0.7 libplacebo338 libpostproc57 libre2-10 libsvtav1enc1d1 libx265-199 openjdk-17-jre-headless python3-mistune0 python3-pytzdata rwhod samba-dsdb-modules
libdaxctl1 libjsoncpp25 libndctl6 libpmem1 libravle0 libroc0.3 libu2f-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
$ sudo apt install dnsutils
dnsutils is already the newest version (1:9.20.1-1).
$ ip address
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 08:00:27:d2:26:79 brd ff:ff:ff:ff:ff:ff
inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute eth0
$ sudo nano /etc/resov.conf
$ sudo nano /etc/resolv.conf
$ sudo nano /etc/resolv.conf
$ sudo nano /etc/bind/named.conf.options
$ sudo nano /etc/bind/named.conf.local


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
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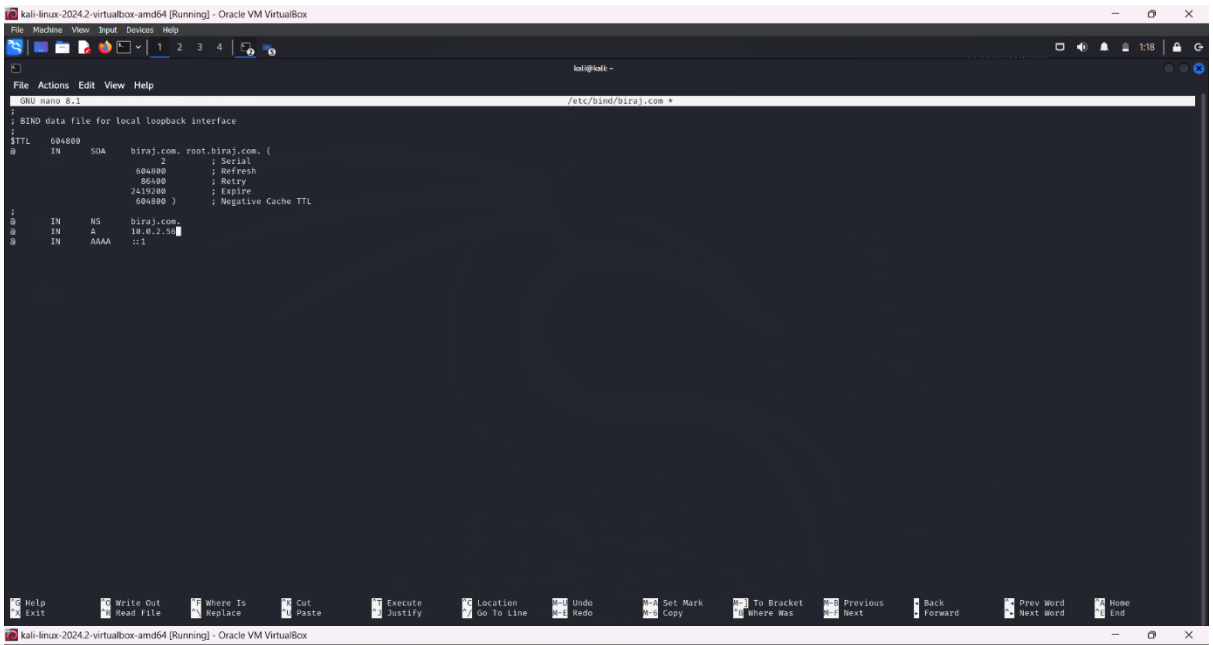
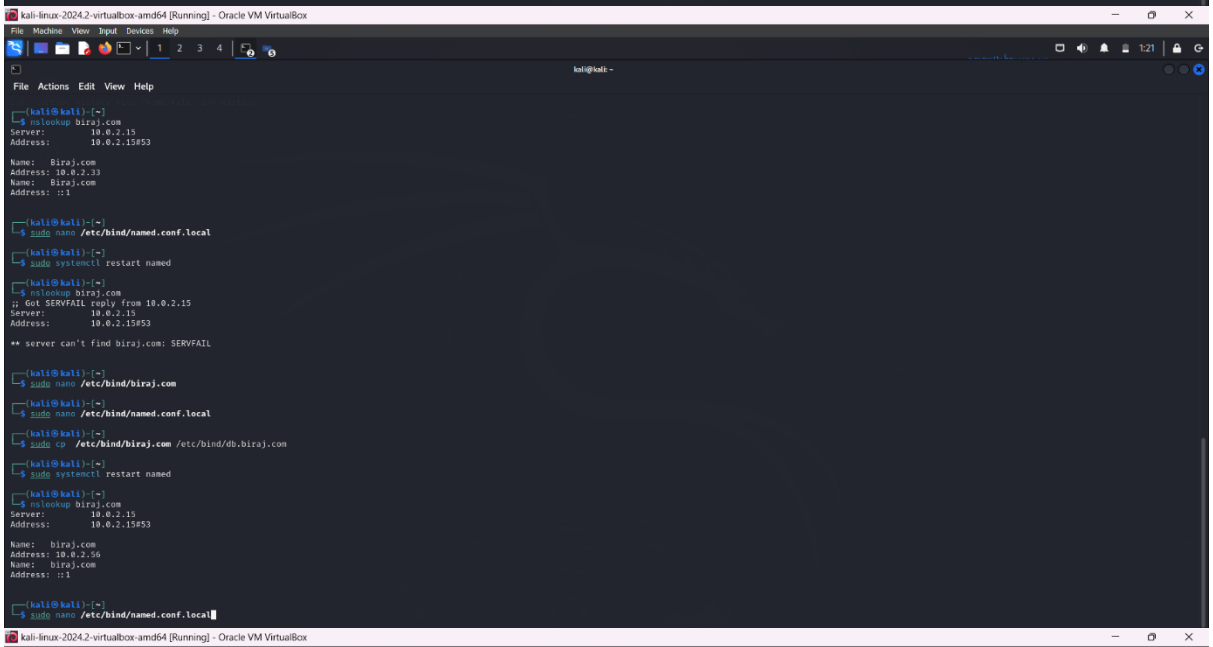
GNU nano 8.1 /etc/bind/named.conf.options
options {
directory "/var/cache/bind";
// If there is a firewall between you and nameservers you want
// to talk to, you may need to fix the firewall to allow multiple
// ports to talk. See http://www.kb.cert.org/vuls/id/800113
// If your ISP provided one or 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 {
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; };
};
Read 24 lines
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location M-U Undo M-A Set Mark M-] To Bracket M-Q Previous ^B Back ^← Prev Word ^A Home
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line M-E Redo M-6 Copy ^Q Where Was M-W Next ^F Forward ^→ Next Word ^E End


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
kali@kali: ~
File Actions Edit View Help
GNU nano 8.1 /etc/bind/biraj.com *
;
; BIND data file for local loopback interface
;
$TTL 604800
@ IN SOA biraj.com. root.biraj.com. (
2 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800) ; Negative Cache TTL
;
@ IN NS biraj.com.
@ IN A 10.0.2.56
@ IN AAAA ::1
Help Write Out Where Is Cut Execute Location Undo 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


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
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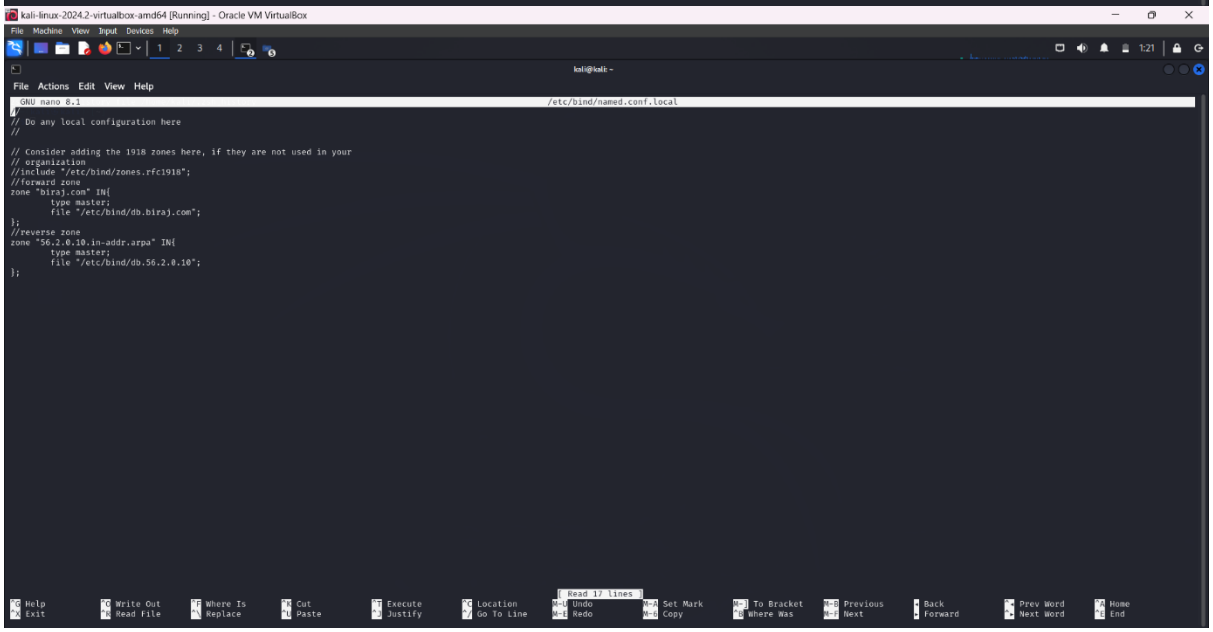
File Actions Edit View Help
(kali㉿kali)-[~]
$ nslookup biraj.com
Server: 10.0.2.15
Address: 10.0.2.15#53
Name: Biraj.com
Address: 10.0.2.33
Name: Biraj.com
Address: ::1
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo systemctl restart named
(kali㉿kali)-[~]
$ nslookup biraj.com
;; Got SERVFAIL reply from 10.0.2.15
Server: 10.0.2.15
Address: 10.0.2.15#53
** server can't find biraj.com: SERVFAIL
(kali㉿kali)-[~]
$ sudo nano /etc/bind/biraj.com
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo cp /etc/bind/biraj.com /etc/bind/db.biraj.com
(kali㉿kali)-[~]
$ sudo systemctl restart named
(kali㉿kali)-[~]
$ nslookup biraj.com
Server: 10.0.2.15
Address: 10.0.2.15#53
Name: biraj.com
Address: 10.0.2.56
Name: biraj.com
Address: ::1
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
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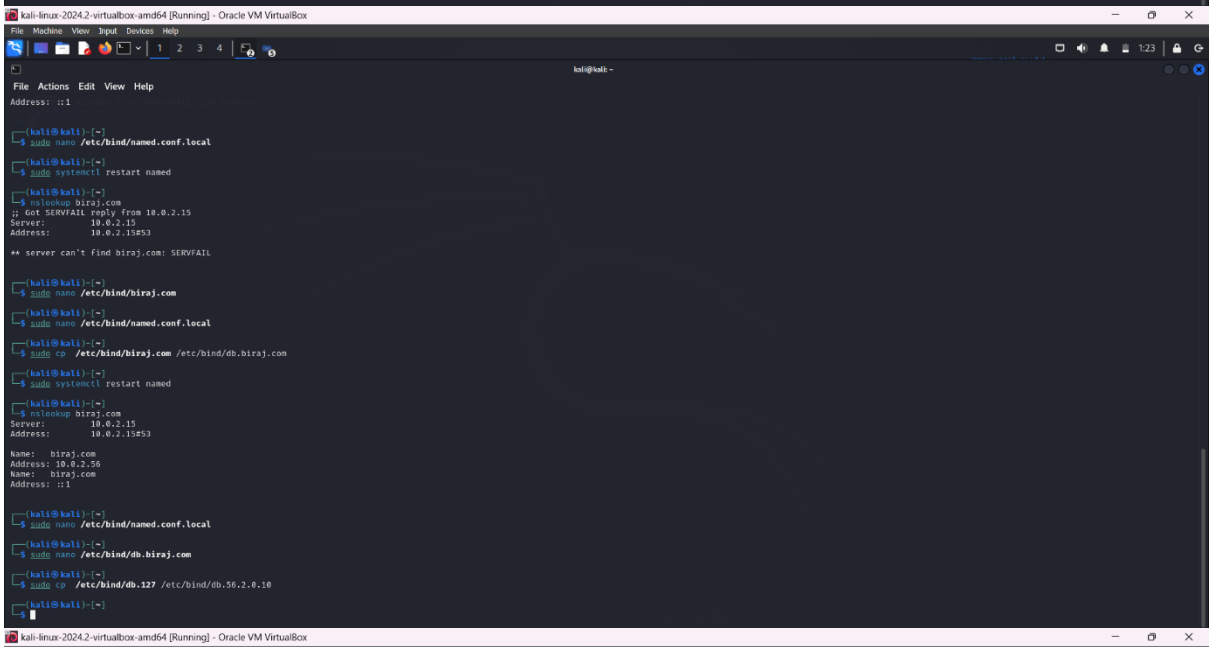
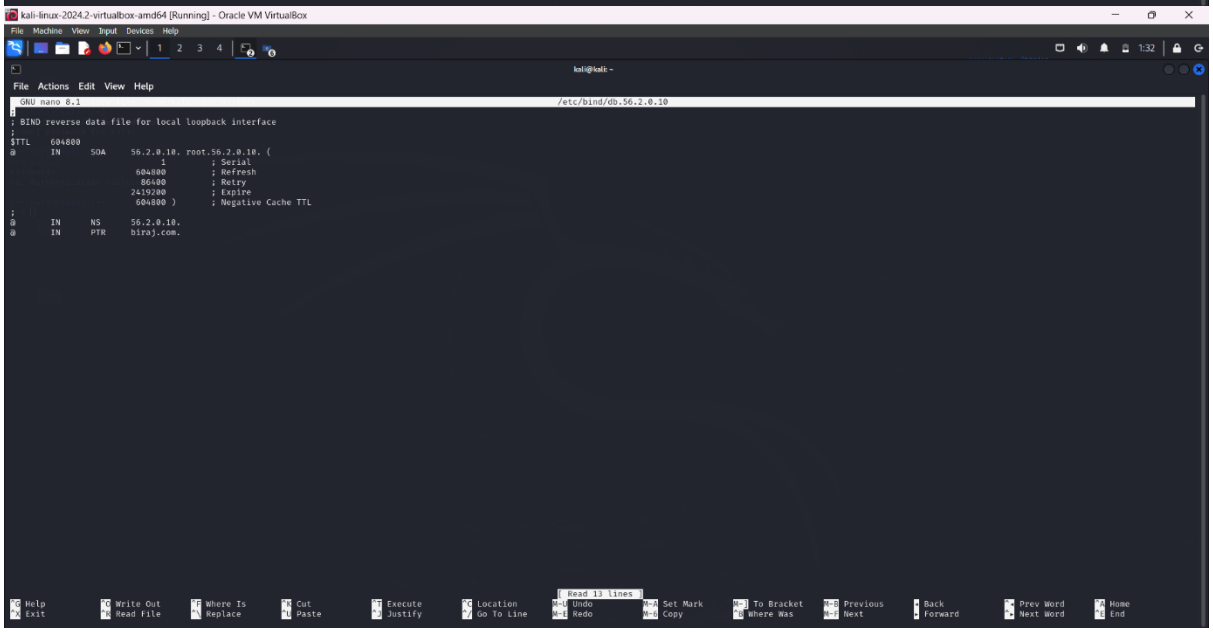
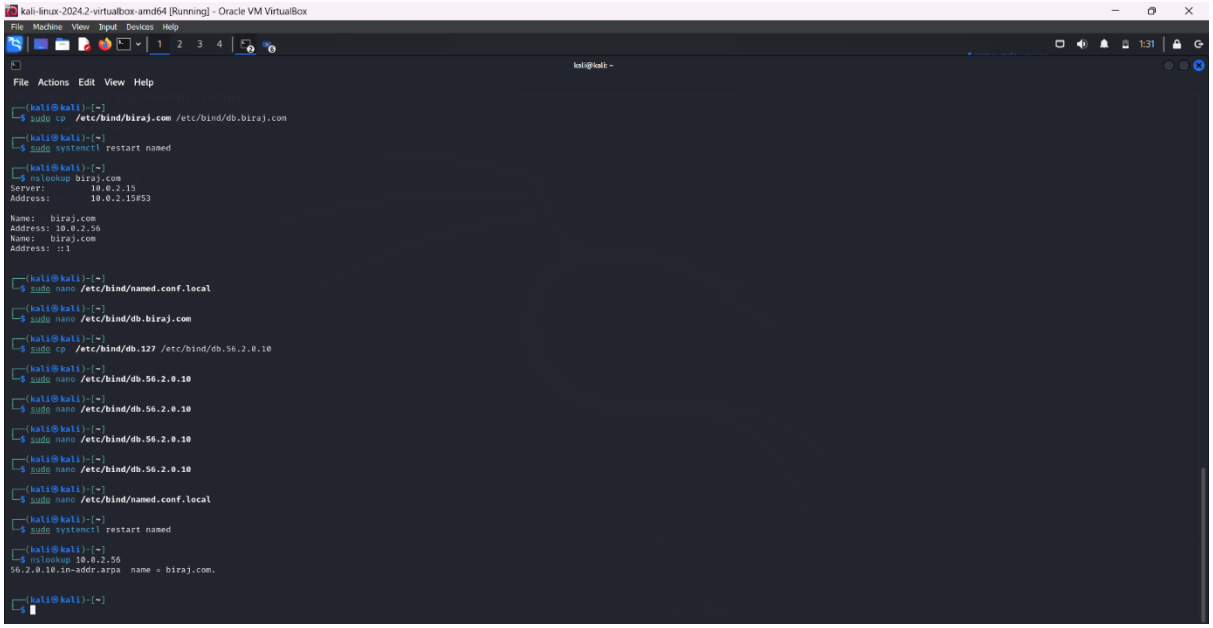
File Actions Edit View Help
GNU nano 8.1 /etc/bind/named.conf.local
//
// Do any local configuration here
//
// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
//forward zone
zone "biraj.com" IN{
type master;
file "/etc/bind/db.biraj.com";
};
//reverse zone
zone "56.2.0.10.in-addr.arpa" IN{
type master;
file "/etc/bind/db.56.2.0.10";
};
Read 17 lines
Help Write Out Where Is Cut Execute Location Undo 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


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
kali@kali: ~
File Actions Edit View Help
GNU nano 8.1 /etc/bind/db.biraj.com
; BIND data file for local loopback interface
;
$TTL 604800
@ IN SOA biraj.com. root.biraj.com. (
2 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800) ; Negative Cache TTL
;
@ IN NS biraj.com.
@ IN A 10.0.2.56
@ IN AAAA ::1
Read 14 lines


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
kali@kali: ~
File Actions Edit View Help
Address: ::1
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo systemctl restart named
(kali㉿kali)-[~]
$ nslookup biraj.com
;; Got SERVFAIL reply from 10.0.2.15
Server: 10.0.2.15
Address: 10.0.2.15#53
** server can't find biraj.com: SERVFAIL
(kali㉿kali)-[~]
$ sudo nano /etc/bind/biraj.com
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo cp /etc/bind/biraj.com /etc/bind/db.biraj.com
(kali㉿kali)-[~]
$ sudo systemctl restart named
(kali㉿kali)-[~]
$ nslookup biraj.com
Server: 10.0.2.15
Address: 10.0.2.15#53
Name: biraj.com
Address: 10.0.2.56
Name: biraj.com
Address: ::1
(kali㉿kali)-[~]
$ sudo nano /etc/bind/named.conf.local
(kali㉿kali)-[~]
$ sudo nano /etc/bind/db.biraj.com
(kali㉿kali)-[~]
$ sudo cp /etc/bind/db.127 /etc/bind/db.56.2.0.10
(kali㉿kali)-[~]
$


kali-linux-2024.2-virtualbox-amd64 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
kali@kali: ~
File Actions Edit View Help
GNU nano 8.1 /etc/bind/db.56.2.0.10
; BIND reverse data file for local loopback interface
;
$TTL 604800
@ IN SOA 56.2.0.10. root.56.2.0.10. (
1 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800) ; Negative Cache TTL
;
@ IN NS 56.2.0.10.
@ IN PTR biraj.com.
Read 13 lines



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