Lab experiment 2: Install and configure DNS

Richard Roy

22UBCA7337

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

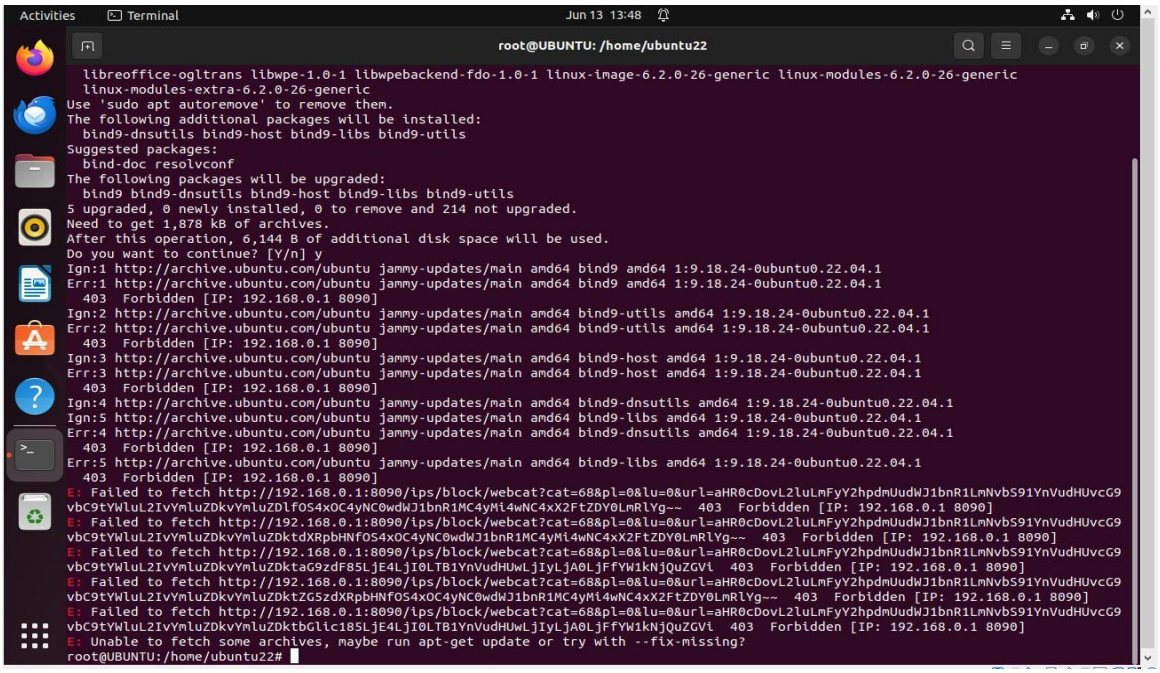
7.Gather information about your DNS server

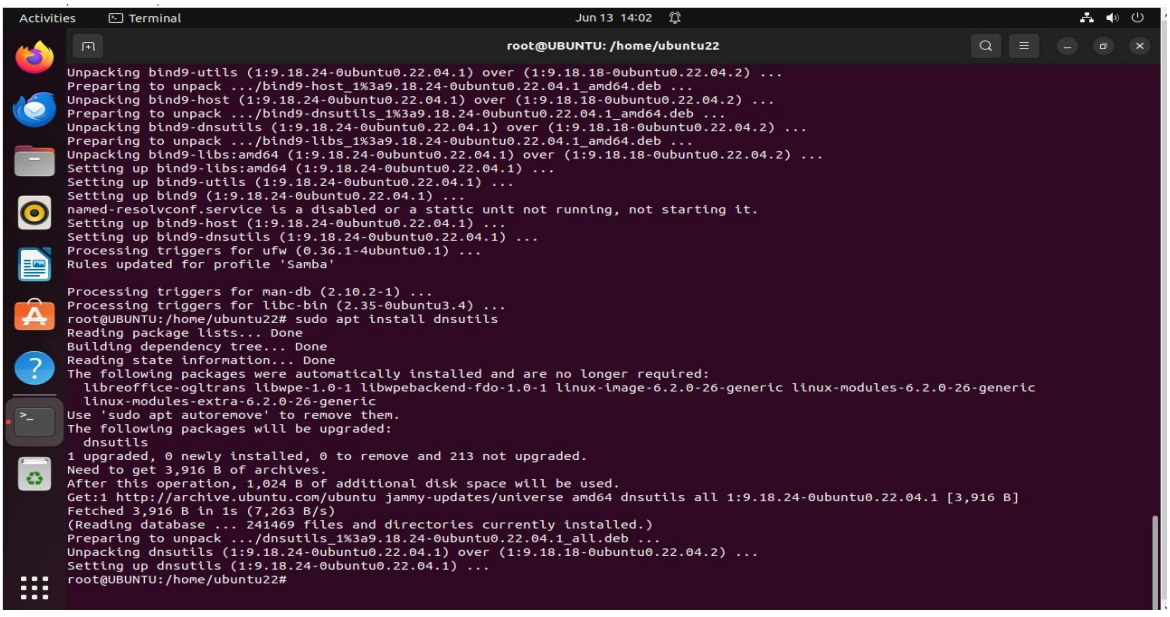
$dig ubuntu.example.com

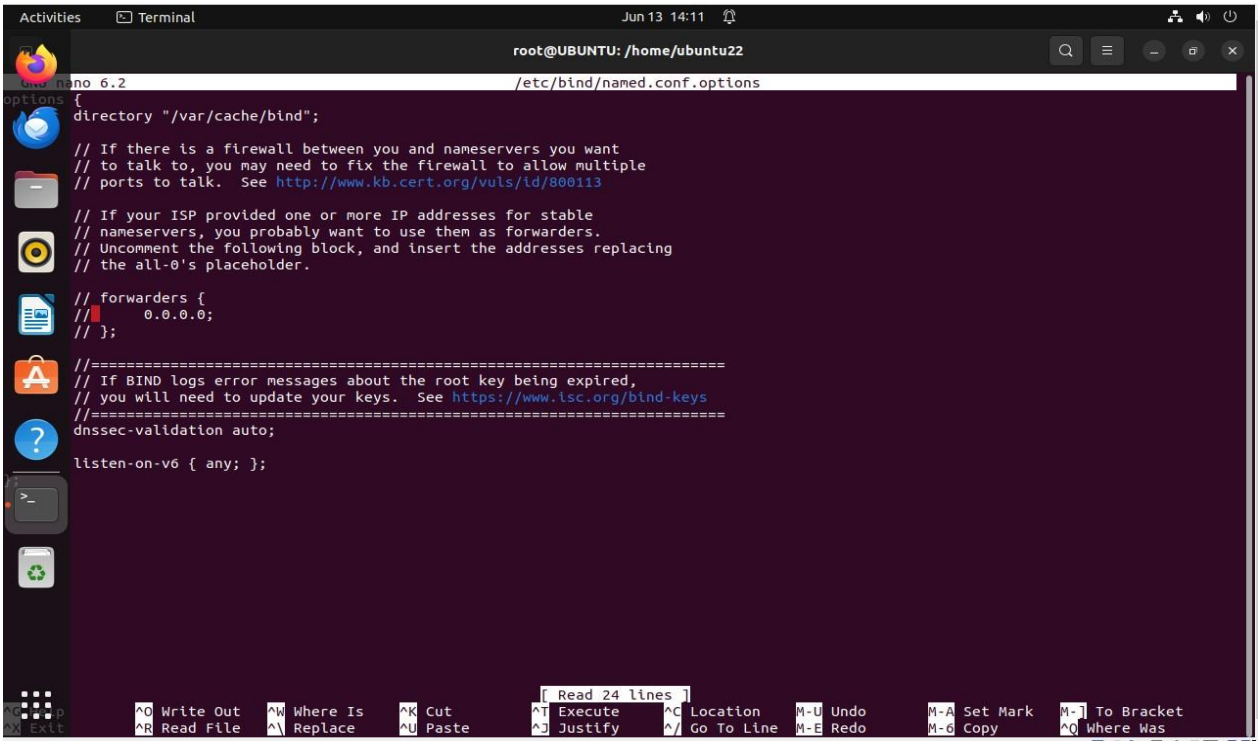
$dig www.example.com

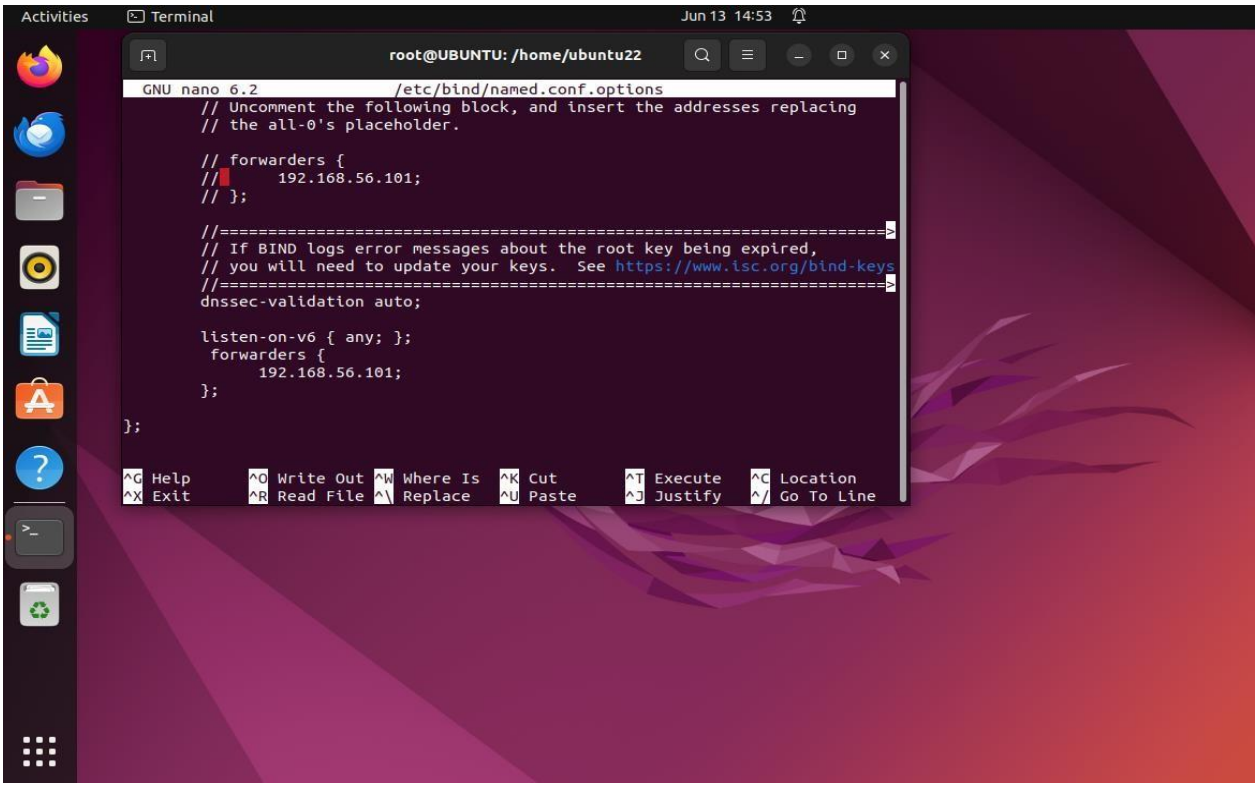
$dig ftp.example.com

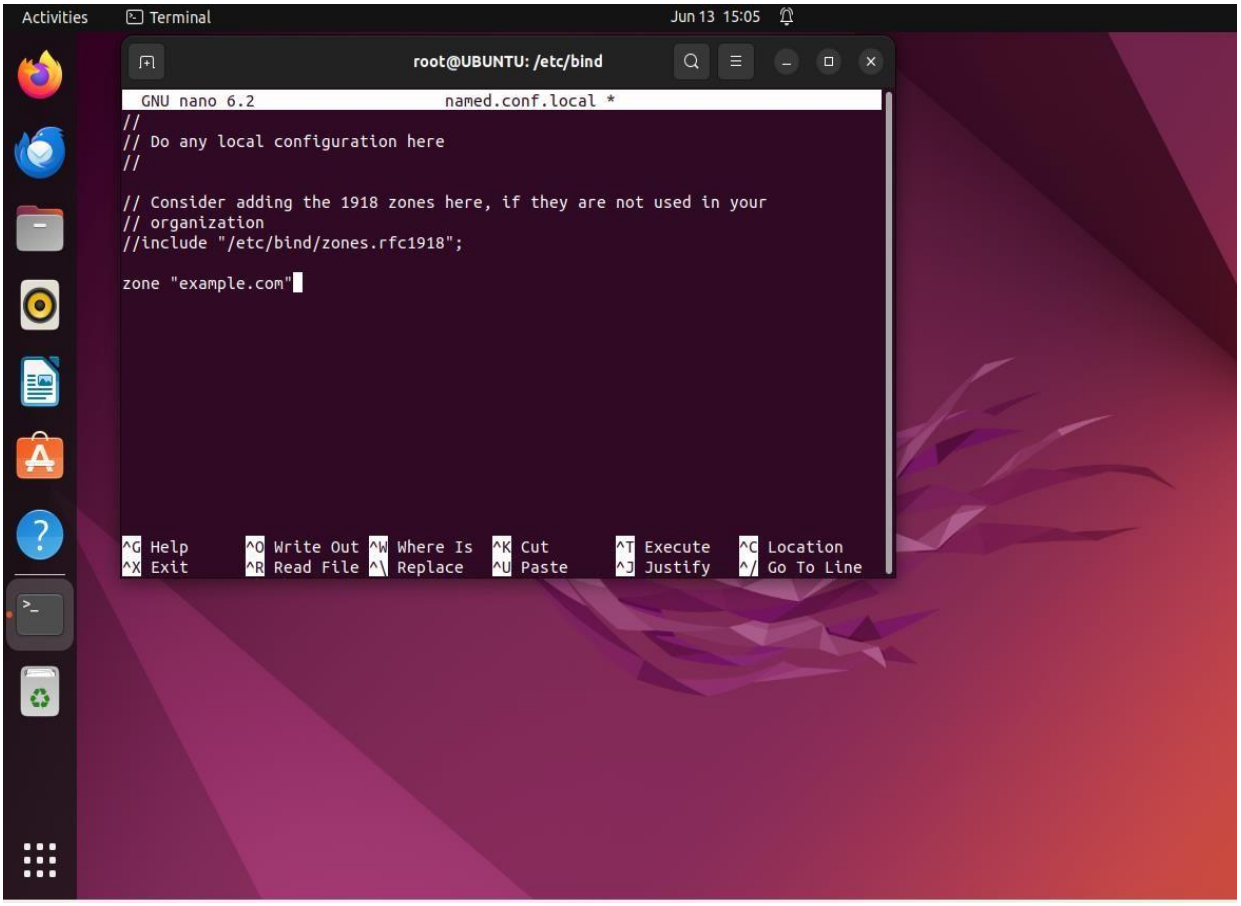
RESULT:

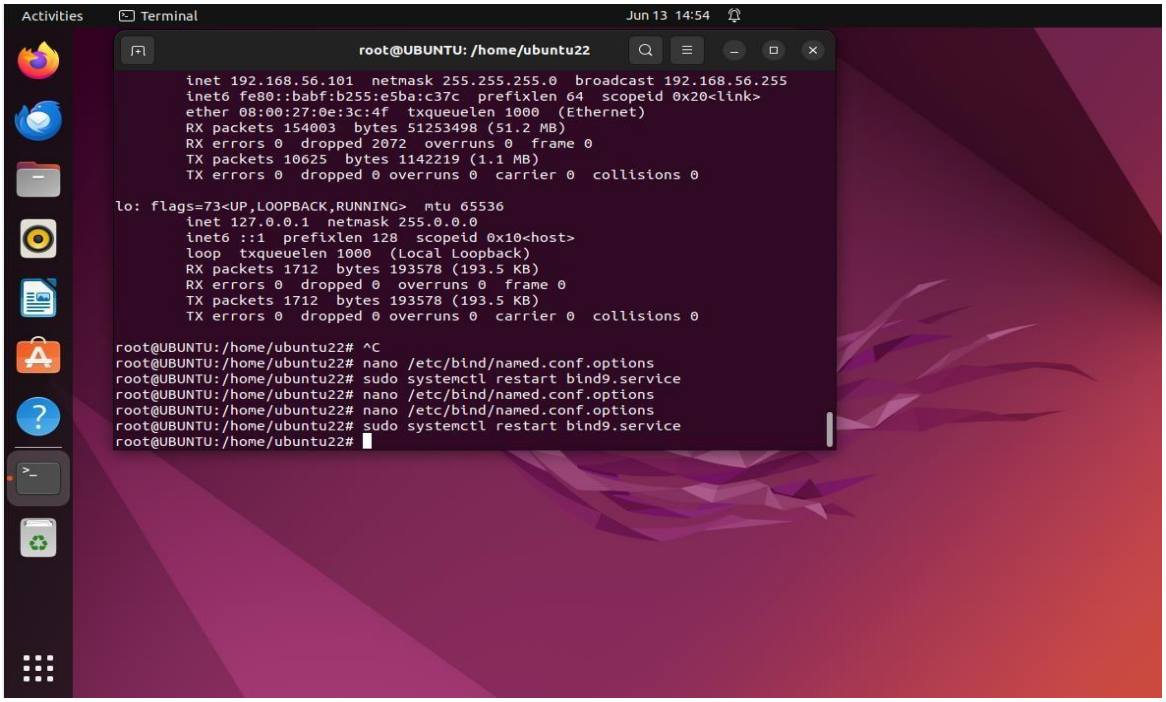


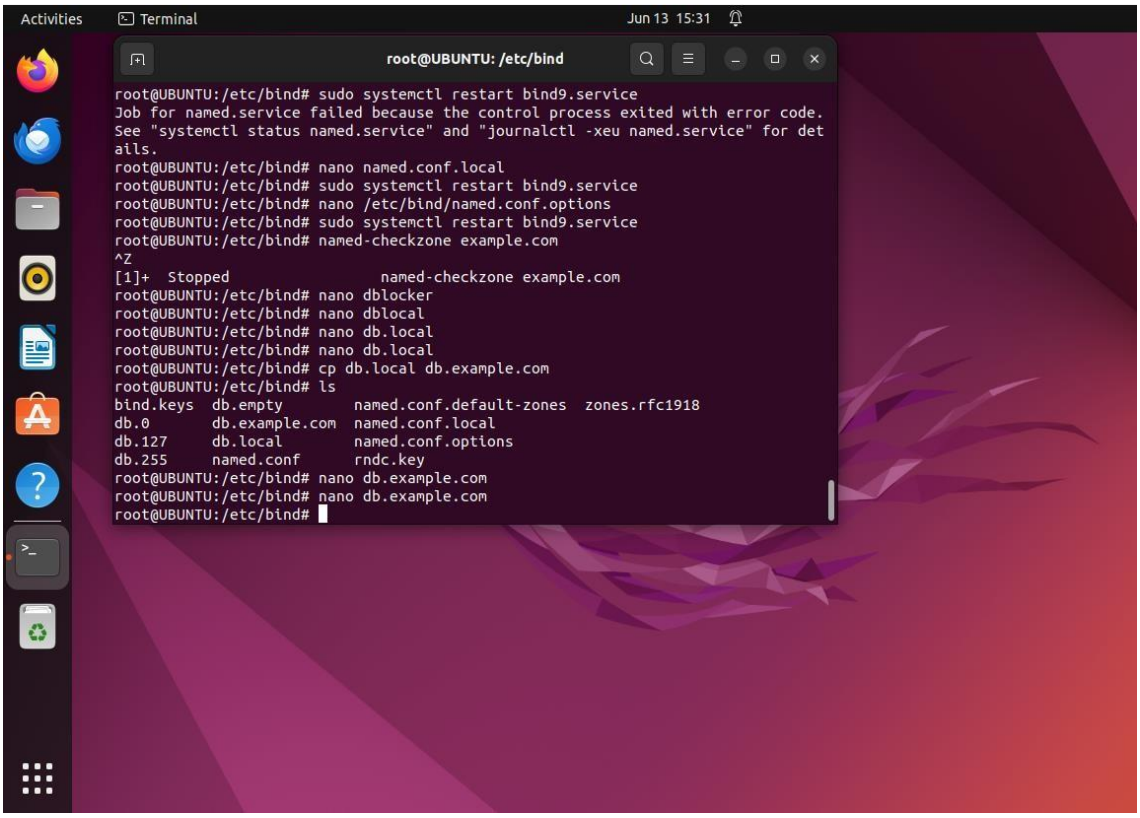



Activities
Terminal
Jun 13 14:11
root@UBUNTU: /home/ubuntu22
GNU nano 6.2 /etc/bind/named.conf.options
{
directory "/var/cache/bind";
// If there is a firewall between you and nameservers you want
// to talk to, you may need to fix the firewall to allow multiple
// ports to talk. See http://www.kb.cert.org/vuls/id/800113
// 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 {
// 0.0.0.0;
// };
//==
// 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]
^O Write Out
^R Read File
^W Where Is
^\ Replace
^K Cut
^U Paste
^T Execute
^J Justify
^C Location
^/ Go To Line
M-U Undo
M-E Redo
M-A Set Mark
M-6 Copy
M-] To Bracket
^Q Where Was

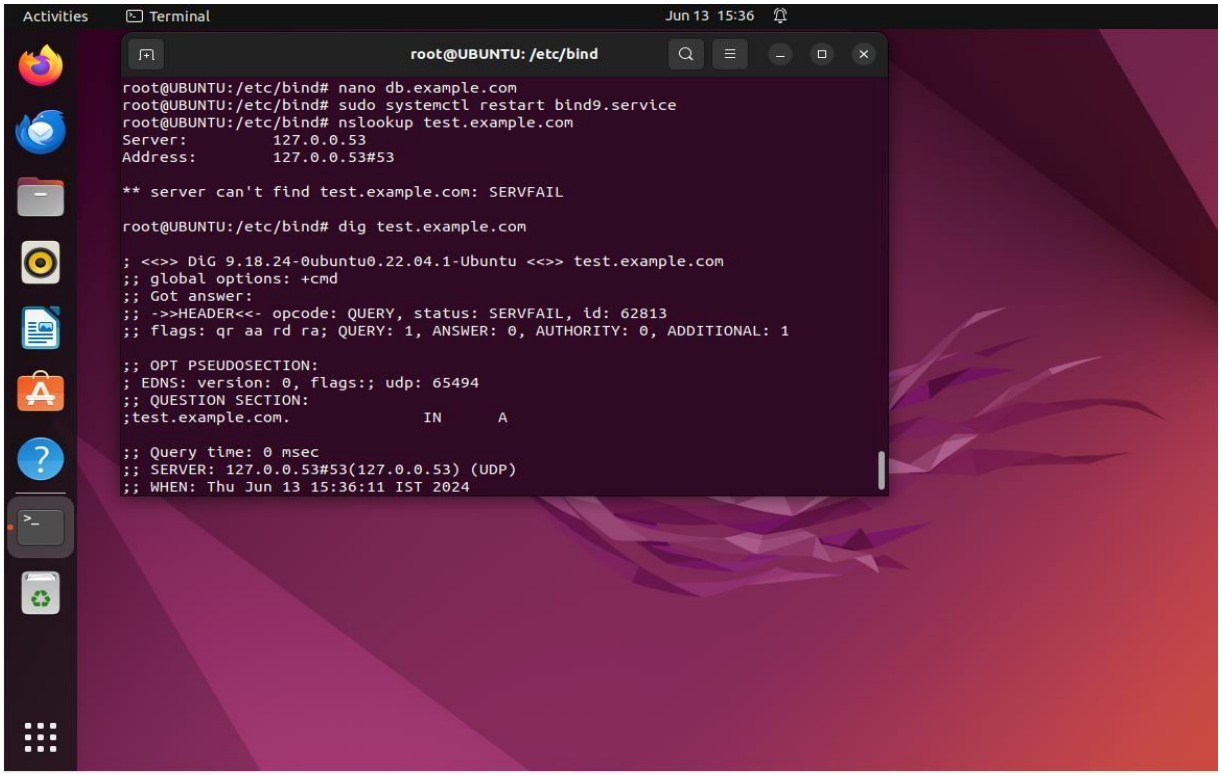

Activities
Terminal
Jun 13 14:53
root@UBUNTU: /home/ubuntu22
GNU nano 6.2 /etc/bind/named.conf.options
// Uncomment the following block, and insert the addresses replacing
// the all-0's placeholder.
// forwarders {
// 192.168.56.101;
// };
//==
// If BIND logs error messages about the root key being expired,
// you will need to update your keys. See https://www.isc.org/bind-keys
//==
dnssec-validation auto;
listen-on-v6 { any; };
forwarders {
192.168.56.101;
};
};
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line

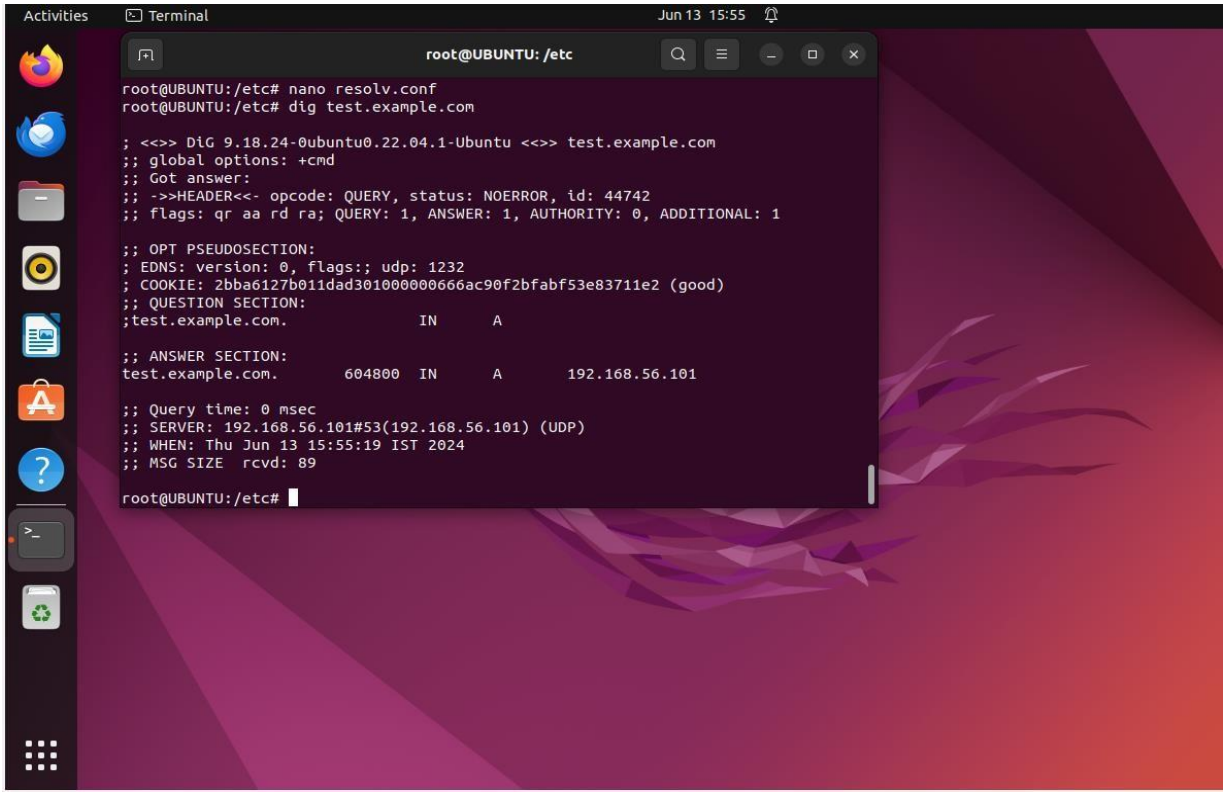

Activities
Terminal
Jun 13 15:05
root@UBUNTU: /etc/bind
GNU nano 6.2 named.conf.local *
//
// Do any local configuration here
//
// Consider adding the 1918 zones here, if they are not used in your
// organization
//include "/etc/bind/zones.rfc1918";
zone "example.com"
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line

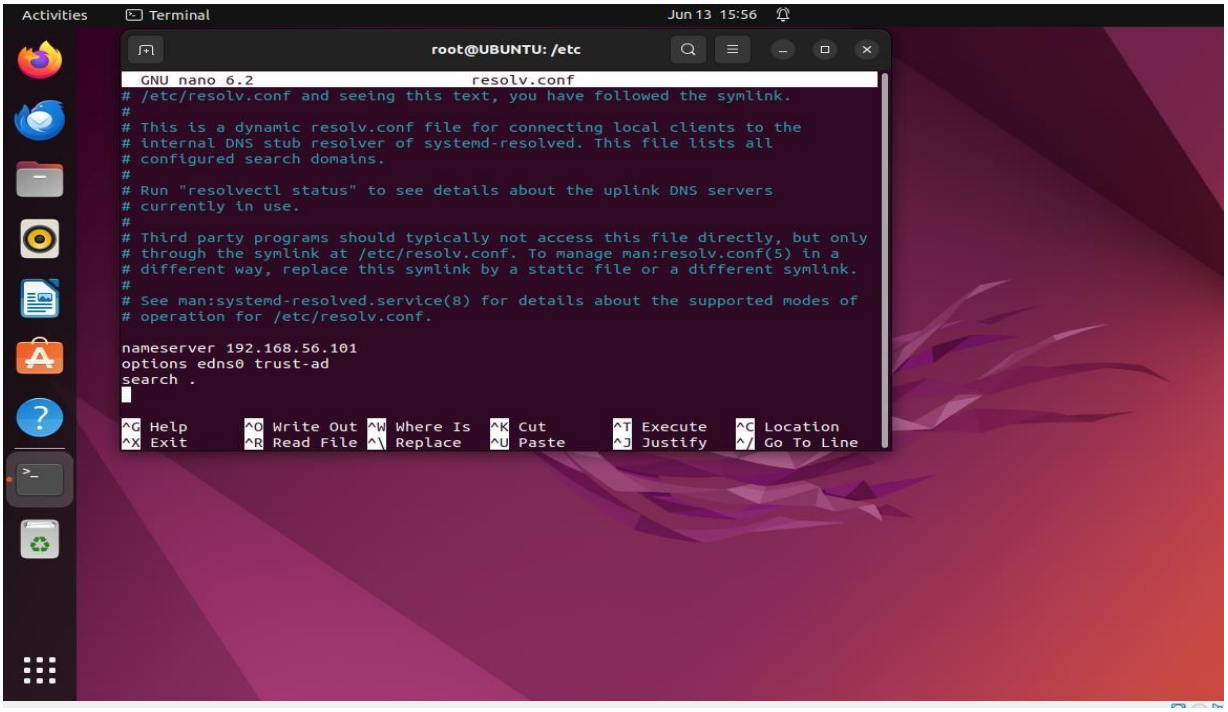

Activities
Terminal
Jun 13 14:54
root@UBUNTU: /home/ubuntu22
inet 192.168.56.101 netmask 255.255.255.0 broadcast 192.168.56.255
inet6 fe80::babf:b255:e5ba:c37c prefixlen 64 scopeid 0x20<link>
ether 08:00:27:0e:3c:4f txqueuelen 1000 (Ethernet)
RX packets 154003 bytes 51253498 (51.2 MB)
RX errors 0 dropped 2072 overruns 0 frame 0
TX packets 10625 bytes 1142219 (1.1 MB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
inet 127.0.0.1 netmask 255.0.0.0
inet6 ::1 prefixlen 128 scopeid 0x10<host>
loop txqueuelen 1000 (Local Loopback)
RX packets 1712 bytes 193578 (193.5 KB)
RX errors 0 dropped 0 overruns 0 frame 0
TX packets 1712 bytes 193578 (193.5 KB)
TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
root@UBUNTU:/home/ubuntu22# ^C
root@UBUNTU:/home/ubuntu22# nano /etc/bind/named.conf.options
root@UBUNTU:/home/ubuntu22# sudo systemctl restart bind9.service
root@UBUNTU:/home/ubuntu22# nano /etc/bind/named.conf.options
root@UBUNTU:/home/ubuntu22# nano /etc/bind/named.conf.options
root@UBUNTU:/home/ubuntu22# sudo systemctl restart bind9.service
root@UBUNTU:/home/ubuntu22#

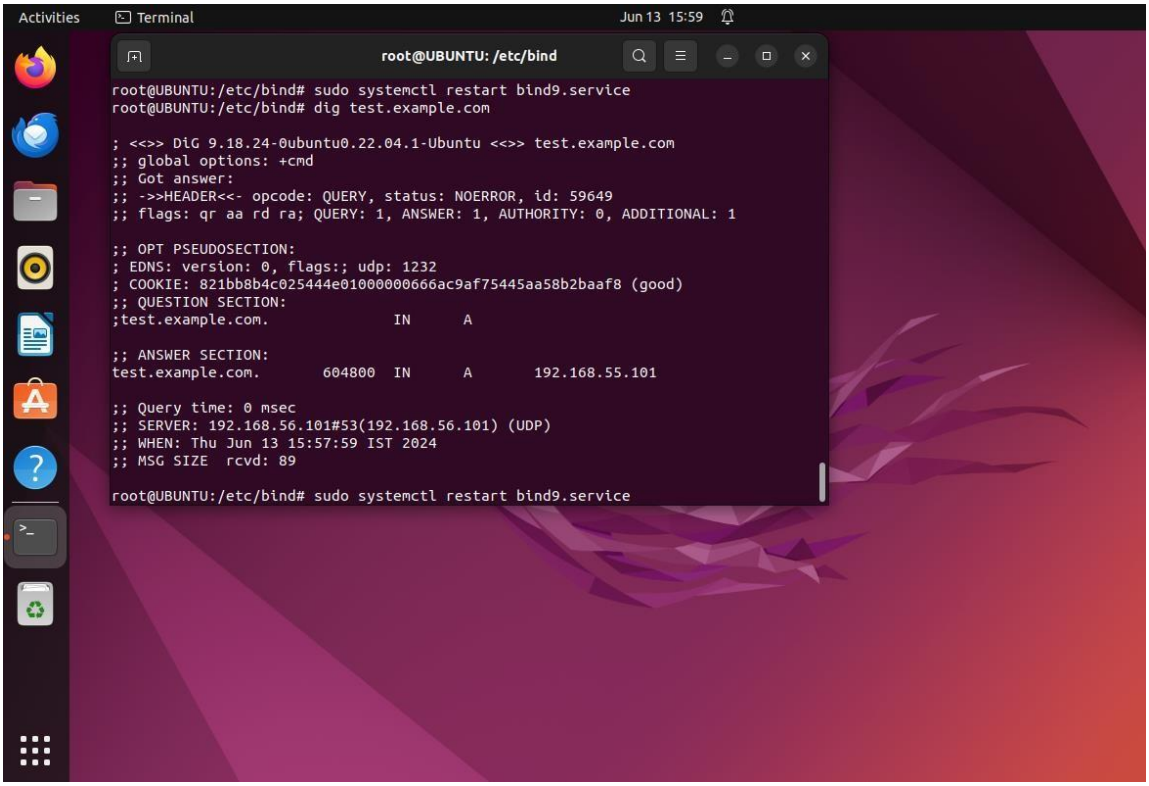

Activities
Terminal
Jun 13 15:31
root@UBUNTU: /etc/bind
root@UBUNTU:/etc/bind# sudo systemctl restart bind9.service
Job for named.service failed because the control process exited with error code.
See "systemctl status named.service" and "journalctl -xeu named.service" for det
ails.
root@UBUNTU:/etc/bind# nano named.conf.local
root@UBUNTU:/etc/bind# sudo systemctl restart bind9.service
root@UBUNTU:/etc/bind# nano /etc/bind/named.conf.options
root@UBUNTU:/etc/bind# sudo systemctl restart bind9.service
root@UBUNTU:/etc/bind# named-checkzone example.com
^Z
[1]+ Stopped named-checkzone example.com
root@UBUNTU:/etc/bind# nano dblocker
root@UBUNTU:/etc/bind# nano dblocal
root@UBUNTU:/etc/bind# nano db.local
root@UBUNTU:/etc/bind# nano db.local
root@UBUNTU:/etc/bind# cp db.local db.example.com
root@UBUNTU:/etc/bind# ls
bind.keys db.empty named.conf.default-zones zones.rfc1918
db.0 db.example.com named.conf.local
db.127 db.local named.conf.options
db.255 named.conf rndc.key
root@UBUNTU:/etc/bind# nano db.example.com
root@UBUNTU:/etc/bind# nano db.example.com
root@UBUNTU:/etc/bind#


Activities
Terminal
Jun 13 15:32
root@UBUNTU: /etc/bind
GNU nano 6.2 db.example.com
; BIND data file for local loopback interface
;
$TTL 604800
@ IN SOA example.com. root.example.com (
2 ; Serial
604800 ; Refresh
86400 ; Retry
2419200 ; Expire
604800) ; Negative Cache TTL
;
@ IN NS example.com
test IN A 192.168.56.101
@ IN A 127.0.0.1
@ IN AAAA ::1
[Read 15 lines]
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line


Activities
Terminal
Jun 13 15:36
root@UBUNTU: /etc/bind
root@UBUNTU:/etc/bind# nano db.example.com
root@UBUNTU:/etc/bind# sudo systemctl restart bind9.service
root@UBUNTU:/etc/bind# nslookup test.example.com
Server: 127.0.0.53
Address: 127.0.0.53#53
** server can't find test.example.com: SERVFAIL
root@UBUNTU:/etc/bind# dig test.example.com
; <<>> DiG 9.18.24-0ubuntu0.22.04.1-Ubuntu <<>> test.example.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: SERVFAIL, id: 62813
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;test.example.com. IN A
;; Query time: 0 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Thu Jun 13 15:36:11 IST 2024


Activities
Terminal
Jun 13 15:55
root@UBUNTU: /etc
root@UBUNTU:/etc# nano resolv.conf
root@UBUNTU:/etc# dig test.example.com
; <<>> DiG 9.18.24-0ubuntu0.22.04.1-Ubuntu <<>> test.example.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 44742
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 2bba6127b011dad301000000666ac90f2bfabf53e83711e2 (good)
;; QUESTION SECTION:
;test.example.com. IN A
;; ANSWER SECTION:
test.example.com. 604800 IN A 192.168.56.101
;; Query time: 0 msec
;; SERVER: 192.168.56.101#53(192.168.56.101) (UDP)
;; WHEN: Thu Jun 13 15:55:19 IST 2024
;; MSG SIZE rcvd: 89
root@UBUNTU:/etc#


Activities
Terminal
Jun 13 15:56
root@UBUNTU: /etc
GNU nano 6.2 resolv.conf
/etc/resolv.conf and seeing this text, you have followed the symlink.
#
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 192.168.56.101
options edns0 trust-ad
search .
^G Help ^O Write Out ^W Where Is ^K Cut ^T Execute ^C Location
^X Exit ^R Read File ^\ Replace ^U Paste ^J Justify ^/ Go To Line



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