

Лабораторная работа №2

Тема «Настройка DNS-сервера»

по дисциплине «Администрирование сетевых подсистем»

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Цель работы:

Приобретение практических навыков по установке и конфигурированию DNS-сервера, усвоение принципов работы системы доменных имён.

Задание

1. Установить на виртуальной машине server DNS-сервер bind и bind-utils.
2. Сконфигурировать на виртуальной машине server кэширующий DNS-сервер.
3. Сконфигурировать на виртуальной машине server первичный DNS-сервер.
4. При помощи утилит dig и host проанализировать работу DNS-сервера.
5. Написать скрипт для Vagrant, фиксирующий действия по установке и конфигурированию DNS-сервера во внутреннем окружении виртуальной машины server. Соответствующим образом внести изменения в Vagrantfile.

Выполнение работы

Установка DNS-сервера

```
C:\Work\mrshcherbak\vagrant>vagrant up server
Bringing machine 'server' up with 'virtualbox' provider...
==> server: You assigned a static IP ending in ".1" to this machine.
==> server: This is very often used by the router and can cause the
==> server: network to not work properly. If the network doesn't work
==> server: properly, try changing this IP.
==> server: You assigned a static IP ending in ".1" to this machine.
==> server: This is very often used by the router and can cause the
==> server: network to not work properly. If the network doesn't work
==> server: properly, try changing this IP.
==> server: Clearing any previously set forwarded ports...
==> server: Clearing any previously set network interfaces...
==> server: Preparing network interfaces based on configuration...
server: Adapter 1: nat
server: Adapter 2: intnet
==> server: Forwarding ports...
server: 22 (guest) => 2222 (host) (adapter 1)
==> server: Running 'pre-boot' VM customizations...
==> server: Booting VM...
==> server: Waiting for machine to boot. This may take a few minutes...
server: SSH address: 127.0.0.1:2222
server: SSH username: vagrant
server: SSH auth method: password
```

```
root@server:~
[mrshcherbak@server.mrshcherbak.net ~]$ sudo -i

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

    #1) Respect the privacy of others.
    #2) Think before you type.
    #3) With great power comes great responsibility.

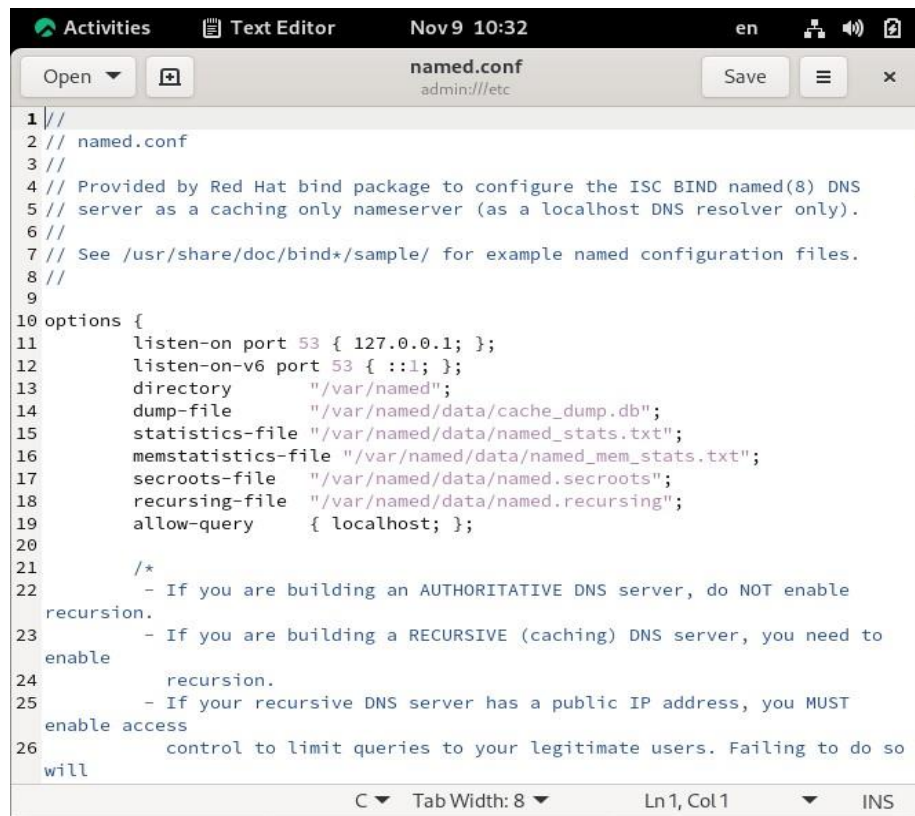
[sudo] password for mrshcherbak:
[root@server.mrshcherbak.net ~]# dnf -y install bind bind-utils
Extra Packages for Enterprise Linux 9 - x86_64 25 kB/s | 23 kB 00:00
Extra Packages for Enterprise Linux 9 - x86_64 2.4 MB/s | 19 MB 00:08
Extra Packages for Enterprise Linux 9 openh 2.2 kB/s | 993 B 00:00
Rocky Linux 9 - BaseOS 7.9 kB/s | 4.1 kB 00:00
Rocky Linux 9 - BaseOS 1.1 MB/s | 1.9 MB 00:01
Rocky Linux 9 - AppStream 9.6 kB/s | 4.5 kB 00:00
Rocky Linux 9 - AppStream 2.0 MB/s | 7.1 MB 00:03
Rocky Linux 9 - Extras 6.1 kB/s | 2.9 kB 00:00
Rocky Linux 9 - Extras 15 kB/s | 11 kB 00:00
```

Вывод информации о домене www.yandex.ru

```
root@server:~  
[root@server.mrshcherbak.net ~]# dig www.yandex.ru  
  
; <<>> DiG 9.16.23-RH <<>> www.yandex.ru  
;; global options: +cmd  
;; Got answer:  
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 3374  
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 0  
  
;; QUESTION SECTION:  
;www.yandex.ru.                IN      A  
  
;; ANSWER SECTION:  
www.yandex.ru.      3600    IN      A       77.88.55.88  
www.yandex.ru.      3600    IN      A       5.255.255.70  
www.yandex.ru.      3600    IN      A       77.88.55.60  
www.yandex.ru.      3600    IN      A       5.255.255.77  
  
;; Query time: 48 msec  
;; SERVER: 10.0.2.3#53(10.0.2.3)  
;; WHEN: Thu Nov 09 10:20:21 UTC 2023
```

Конфигурирование кэширующего DNS-сервера при отсутствии фильтрации DNS-запросов маршрутизаторами

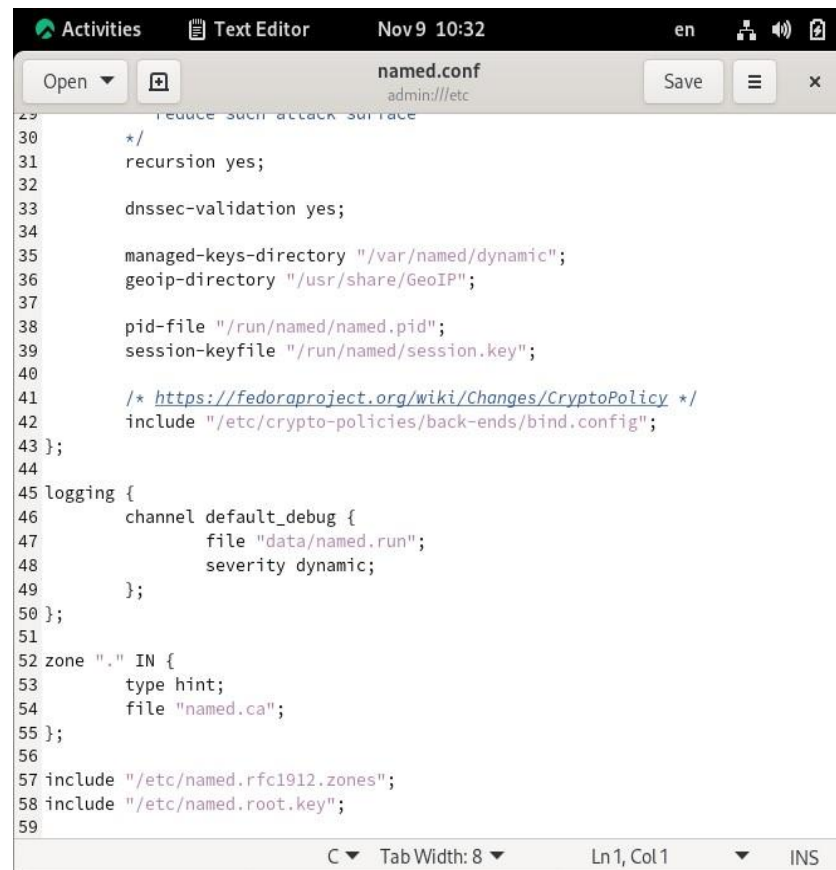
```
Activities Text Editor Nov 9 10:25 en  
Open resolv.conf [Read-Only] Save  
/etc  
1 # Generated by NetworkManager  
2 search mrshcherbak.net  
3 nameserver 10.0.2.3
```



The screenshot shows a text editor window titled 'named.conf' with the path 'admin:///etc'. The file content is as follows:

```
1 //
2 // named.conf
3 //
4 // Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
5 // server as a caching only nameserver (as a localhost DNS resolver only).
6 //
7 // See /usr/share/doc/bind*/sample/ for example named configuration files.
8 //
9
10 options {
11     listen-on port 53 { 127.0.0.1; };
12     listen-on-v6 port 53 { ::1; };
13     directory "/var/named";
14     dump-file "/var/named/data/cache_dump.db";
15     statistics-file "/var/named/data/named_stats.txt";
16     memstatistics-file "/var/named/data/named_mem_stats.txt";
17     secroots-file "/var/named/data/named.secroots";
18     recursing-file "/var/named/data/named.recursing";
19     allow-query { localhost; };
20
21     /*
22      * - If you are building an AUTHORITATIVE DNS server, do NOT enable
23      * recursion.
24      * - If you are building a RECURSIVE (caching) DNS server, you need to
25      * enable recursion.
26      * - If your recursive DNS server has a public IP address, you MUST
27      * enable access
28      * control to limit queries to your legitimate users. Failing to do so
29      * will
```

Содержимое файла /etc/named.conf



The screenshot shows a text editor window titled 'named.conf' with the path 'admin:///etc'. The file content continues from the previous screenshot:

```
30     /*
31     recursion yes;
32
33     dnssec-validation yes;
34
35     managed-keys-directory "/var/named/dynamic";
36     geoip-directory "/usr/share/GeoIP";
37
38     pid-file "/run/named/named.pid";
39     session-keyfile "/run/named/session.key";
40
41     /* https://fedoraproject.org/wiki/Changes/CryptoPolicy */
42     include "/etc/crypto-policies/back-ends/bind.config";
43 };
44
45 logging {
46     channel default_debug {
47         file "data/named.run";
48         severity dynamic;
49     };
50 };
51
52 zone "." IN {
53     type hint;
54     file "named.ca";
55 };
56
57 include "/etc/named.rfc1912.zones";
58 include "/etc/named.root.key";
59
```

Содержимое файла /var/named/named.ca

```
Activities Text Editor Nov 9 10:35 en
named.ca
admin:///var/named
Save

1
2 ; <<>> DiG 9.11.3-RedHat-9.11.3-3.fc27 <<>> +bufsize=1200 +nored @a.root-
servers.net
3 ; (2 servers found)
4 ;; global options: +cmd
5 ;; Got answer:
6 ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 46900
7 ;; flags: qr aa; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 27
8
9 ;; OPT PSEUDOSECTION:
10 EDNS: version: 0, flags:; udp: 1472
11 ;; QUESTION SECTION:
12 ;.                               IN      NS
13
14 ;; ANSWER SECTION:
15 .                               518400 IN      NS      a.root-servers.net.
16 .                               518400 IN      NS      b.root-servers.net.
17 .                               518400 IN      NS      c.root-servers.net.
18 .                               518400 IN      NS      d.root-servers.net.
19 .                               518400 IN      NS      e.root-servers.net.
20 .                               518400 IN      NS      f.root-servers.net.
21 .                               518400 IN      NS      g.root-servers.net.
22 .                               518400 IN      NS      h.root-servers.net.
23 .                               518400 IN      NS      i.root-servers.net.
24 .                               518400 IN      NS      j.root-servers.net.
25 .                               518400 IN      NS      k.root-servers.net.
26 .                               518400 IN      NS      l.root-servers.net.
27 .                               518400 IN      NS      m.root-servers.net.
28
29 ;; ADDITIONAL SECTION:
```

Содержимое файлов
/var/named/named.localhost и
/var/named/named.loopback

```
[root@server.mrshcherbak.net ~]# cat /var/named/named.localhost
$TTL 1D
@      IN SOA  @ rname.invalid. (
                                0      ; serial
                                1D      ; refresh
                                1H      ; retry
                                1W      ; expire
                                3H )    ; minimum

NS     @
A      127.0.0.1
AAAA   ::1

[root@server.mrshcherbak.net ~]# cat /var/named/named.loopback
$TTL 1D
@      IN SOA  @ rname.invalid. (
                                0      ; serial
                                1D      ; refresh
                                1H      ; retry
                                1W      ; expire
                                3H )    ; minimum

NS     @
A      127.0.0.1
AAAA   ::1
PTR    localhost.
[root@server.mrshcherbak.net ~]#
```

```

[root@server.mrshcherbak.net ~]# systemctl start named
[root@server.mrshcherbak.net ~]# systemctl enable named
Created symlink /etc/systemd/system/multi-user.target.wants/named.service → /usr
/lib/systemd/system/named.service.
[root@server.mrshcherbak.net ~]# dig www.yandex.ru

; <<> DiG 9.16.23-RH <<> www.yandex.ru
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 33200
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;www.yandex.ru.                IN      A

;; ANSWER SECTION:
www.yandex.ru.      3600    IN      A       77.88.55.88
www.yandex.ru.      3600    IN      A       77.88.55.60
www.yandex.ru.      3600    IN      A       5.255.255.70
www.yandex.ru.      3600    IN      A       5.255.255.77

;; Query time: 35 msec
;; SERVER: 10.0.2.3#53(10.0.2.3)
;; WHEN: Thu Nov 09 10:38:00 UTC 2023
;; MSG SIZE rcvd: 95

```

```

[root@server.mrshcherbak.net ~]# dig @127.0.0.1 www.yandex.ru

; <<> DiG 9.16.23-RH <<> @127.0.0.1 www.yandex.ru
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 44037
;; flags: qr rd ra; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 86c6112a12ca3da901000000654cb6a8eba814ea90ddb157 (good)
;; QUESTION SECTION:
;www.yandex.ru.                IN      A

;; ANSWER SECTION:
www.yandex.ru.      300     IN      A       5.255.255.70
www.yandex.ru.      300     IN      A       77.88.55.60
www.yandex.ru.      300     IN      A       5.255.255.77
www.yandex.ru.      300     IN      A       77.88.55.88

;; Query time: 1850 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Thu Nov 09 10:38:32 UTC 2023
;; MSG SIZE rcvd: 134

[root@server.mrshcherbak.net ~]#

```


Настройка DNS-сервера сервером по умолчанию для хоста server и внутренней виртуальной сети

```
[root@server.mrshcherbak.net ~]# nmcli connection edit eth0

===| nmcli interactive connection editor |===

Editing existing '802-3-ethernet' connection: 'eth0'

Type 'help' or '?' for available commands.
Type 'print' to show all the connection properties.
Type 'describe [<setting>.<prop>]' for detailed property description.

You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-
lx, dcb, sriov, ethtool, match, ipv4, ipv6, hostname, tc, proxy
nmcli> ^C
nmcli> ^C
nmcli> remove ipv4.dns
nmcli> set ipv4.ignore-auto-dns yes
nmcli> set ipv4.dns 127.0.0.1
nmcli> save
Connection 'eth0' (50b01577-8896-4337-a2ee-c1c35717f76d) successfully updated.
nmcli> quit
[root@server.mrshcherbak.net ~]#
```

то же самое для соединения
System eth0

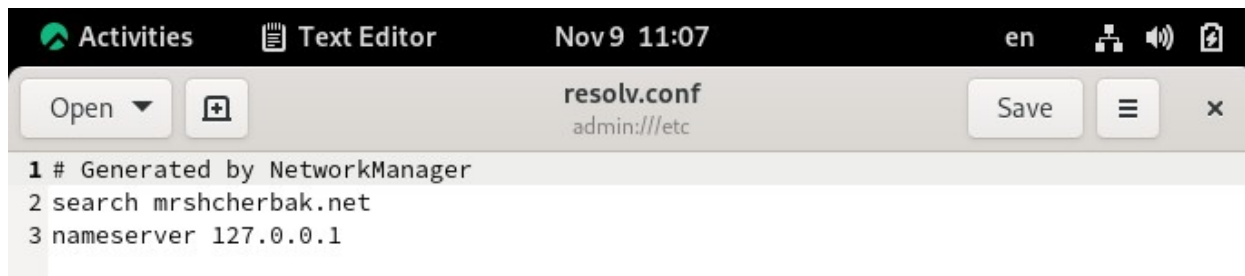
```
[root@server.mrshcherbak.net ~]# nmcli connection edit System\ eth0

===| nmcli interactive connection editor |===

Editing existing '802-3-ethernet' connection: 'System eth0'

Type 'help' or '?' for available commands.
Type 'print' to show all the connection properties.
Type 'describe [<setting>.<prop>]' for detailed property description.

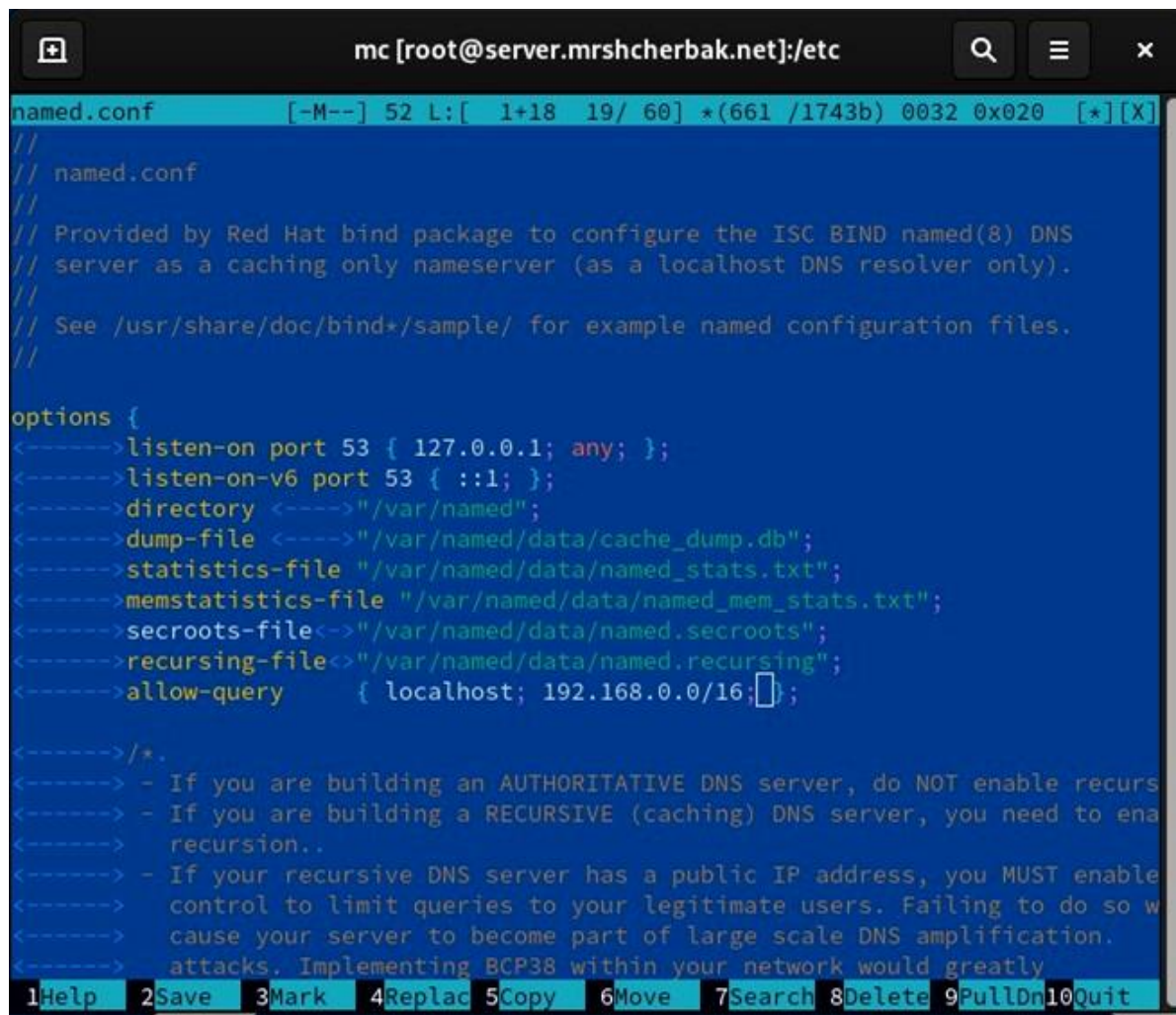
You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-
lx, dcb, sriov, ethtool, match, ipv4, ipv6, hostname, tc, proxy
nmcli> remove ipv4.dns
nmcli> set ipv4.ignore-auto-dns yes
nmcli> set ipv4.dns 127.0.0.1
nmcli> save
Connection 'System eth0' (5fb06bd0-0bb0-7ffb-45f1-d6edd65f3e03) successfully up-
dated.
nmcli> quit
[root@server.mrshcherbak.net ~]#
```



The screenshot shows a Linux desktop with a top bar containing 'Activities', 'Text Editor', and the date 'Nov 9 11:07'. The text editor window is titled 'resolv.conf' and shows the following content:

```
1 # Generated by NetworkManager
2 search mrshcherbak.net
3 nameserver 127.0.0.1
```

Редактирование файла
/etc/named.conf



The screenshot shows a terminal window with the prompt 'mc [root@server.mrshcherbak.net]:/etc'. The file 'named.conf' is open and being edited. The content of the file is as follows:

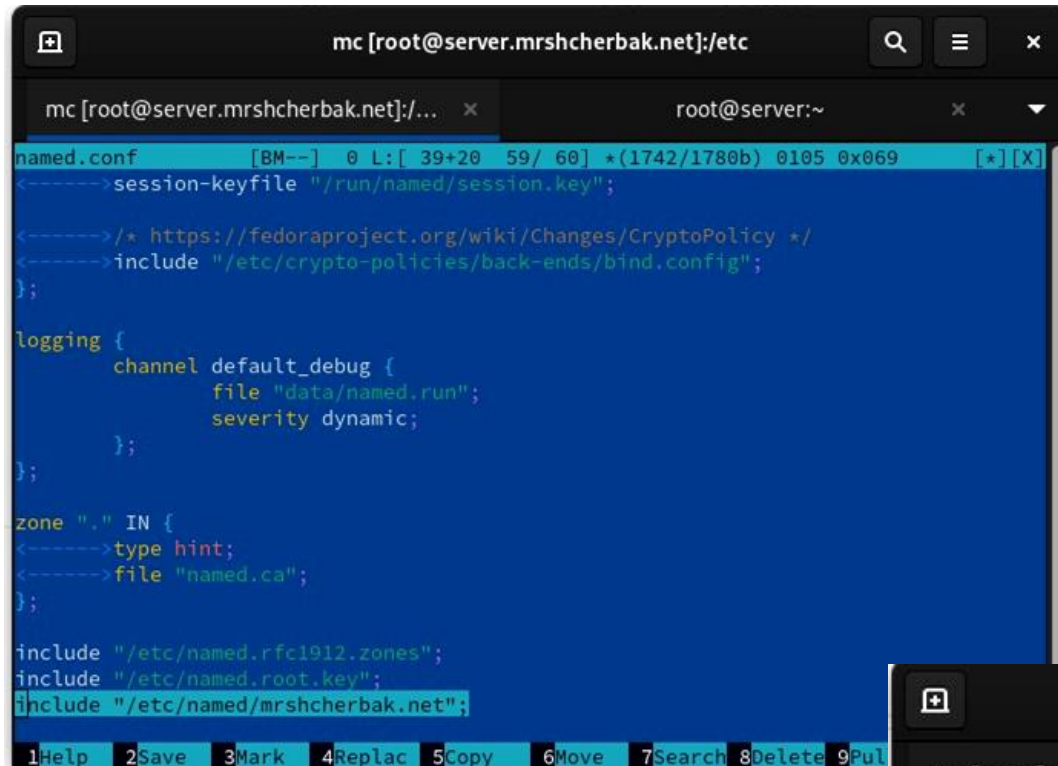
```
named.conf [-M--] 52 L:[ 1+18 19/ 60] *(661 /1743b) 0032 0x020 [*][X]
//
// named.conf
//
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only nameserver (as a localhost DNS resolver only).
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
options {
<----->listen-on port 53 { 127.0.0.1; any; };
<----->listen-on-v6 port 53 { ::1; };
<----->directory <----->"/var/named";
<----->dump-file <----->"/var/named/data/cache_dump.db";
<----->statistics-file "/var/named/data/named_stats.txt";
<----->memstatistics-file "/var/named/data/named_mem_stats.txt";
<----->secroots-file<----->"/var/named/data/named.secrets";
<----->recursing-file<----->"/var/named/data/named.recursing";
<----->allow-query { localhost; 192.168.0.0/16; };
<----->/*.
<----->- If you are building an AUTHORITATIVE DNS server, do NOT enable recurs
<----->- If you are building a RECURSIVE (caching) DNS server, you need to ena
<----->- recursion..
<----->- If your recursive DNS server has a public IP address, you MUST enable
<----->- control to limit queries to your legitimate users. Failing to do so w
<----->- cause your server to become part of large scale DNS amplification.
<----->- attacks. Implementing BCP38 within your network would greatly
1Help 2Save 3Mark 4Replac 5Copy 6Move 7Search 8Delete 9PullDn10Quit
```

```
root@server:~  
[root@server.mrshcherbak.net ~]# firewall-cmd --add-service=dns  
success  
[root@server.mrshcherbak.net ~]# firewall-cmd --add-service=dns --permanent  
success  
[root@server.mrshcherbak.net ~]# lsof | grep UDP  
lsof: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1001/gvfs  
Output information may be incomplete.  
avahi-dae  563      UDP *:mdns          avahi  12u    IPv4      18829  
0t0  
avahi-dae  563      UDP *:mdns          avahi  13u    IPv6      18830  
0t0  
avahi-dae  563      UDP *:40338        avahi  14u    IPv4      18831  
0t0  
avahi-dae  563      UDP *:51103        avahi  15u    IPv6      18832  
0t0  
chronyd    588      UDP localhost:323   chrony  5u     IPv4      18707  
0t0  
chronyd    588      UDP localhost:323   chrony  6u     IPv6      18708  
0t0  
chronyd    588      UDP 195417 protocol: UDP chrony  8u     sock      0,8  
0t0  
named      12200     UDP localhost:domain named  16u    IPv4      208942  
0t0  
named      12200     UDP localhost:domain named  19u    IPv6      208944  
0t0  
named      12200 12201 isc-net-0         named  16u    IPv4      208942  
0t0  
named      12200 12201 isc-net-0         named  19u    IPv6      208944  
0t0  
named      12200 12202 isc-timer         named  16u    IPv4      208942
```

Конфигурирование первичного DNS-сервера

```
[root@server.mrshcherbak.net ~]# cp /etc/named.rfc1912.zones /etc/named/  
[root@server.mrshcherbak.net ~]# cd /etc/named  
[root@server.mrshcherbak.net named]# mv /etc/named/named.rfc1912.zones /etc/named/mrshcherbak.net
```

Редактирование файла /etc/named.conf



```
mc [root@server.mrshcherbak.net]:/etc
named.conf [BM--] 0 L:[ 39+20 59/ 60] *(1742/1780b) 0105 0x069 [*] [X]
<----->session-keyfile "/run/named/session.key";

<----->/* https://fedoraproject.org/wiki/Changes/CryptoPolicy */
<----->include "/etc/crypto-policies/back-ends/bind.config";
};

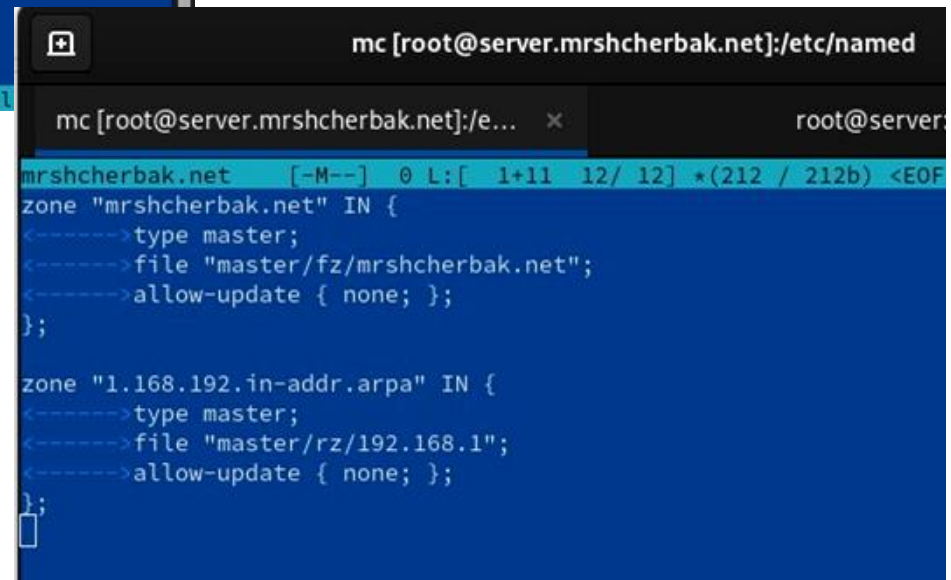
logging {
    channel default_debug {
        file "data/named.run";
        severity dynamic;
    };
};

zone "." IN {
<----->type hint;
<----->file "named.ca";
};

include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
include "/etc/named/mrshcherbak.net";

1Help 2Save 3Mark 4Replac 5Copy 6Move 7Search 8Delete 9Pul
```

Редактирование файла
/etc/named/mrshcherbak.net



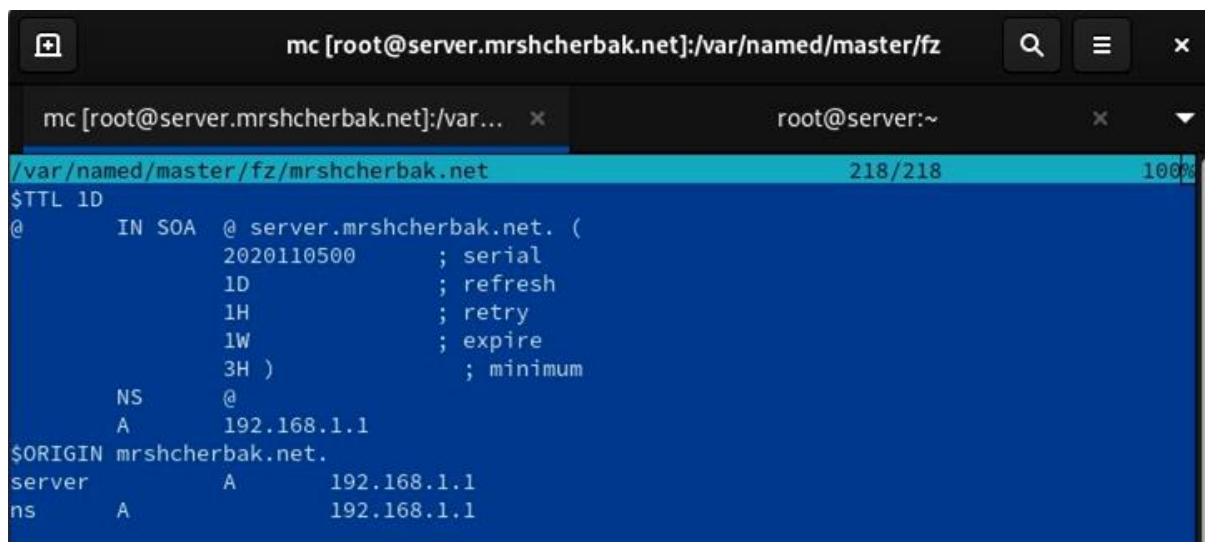
```
mc [root@server.mrshcherbak.net]:/etc/named
mrshcherbak.net [-M--] 0 L:[ 1+11 12/ 12] *(212 / 212b) <EOF
zone "mrshcherbak.net" IN {
<----->type master;
<----->file "master/fz/mrshcherbak.net";
<----->allow-update { none; };
};

zone "1.168.192.in-addr.arpa" IN {
<----->type master;
<----->file "master/rz/192.168.1";
<----->allow-update { none; };
};

```

```
[root@server.mrshcherbak.net ~]# cd /var/named
[root@server.mrshcherbak.net named]# cp /var/named/named.localhost /var/named/master/fz/
[root@server.mrshcherbak.net named]# cd /var/named/master/fz/
[root@server.mrshcherbak.net fz]# mv named.localhost mrshcherbak.net
[root@server.mrshcherbak.net fz]#
```

Редактирование файла /var/named/master/fz/mrshcherbak.net

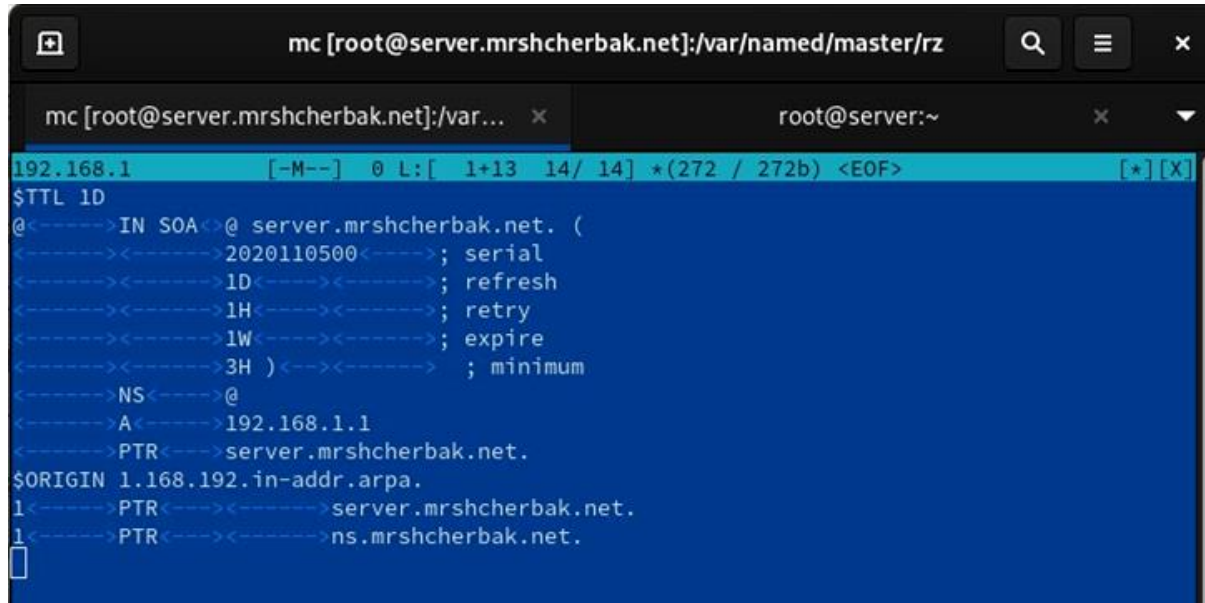


```
mc [root@server.mrshcherbak.net]:/var/named/master/fz
mc [root@server.mrshcherbak.net]:/var... x root@server:~ x
/var/named/master/fz/mrshcherbak.net 218/218 100%
$TTL 1D
@      IN SOA  @ server.mrshcherbak.net. (
        2020110500      ; serial
        1D              ; refresh
        1H              ; retry
        1W              ; expire
        3H )            ; minimum
      NS   @
      A    192.168.1.1
$ORIGIN mrshcherbak.net.
server  A      192.168.1.1
ns      A      192.168.1.1
```

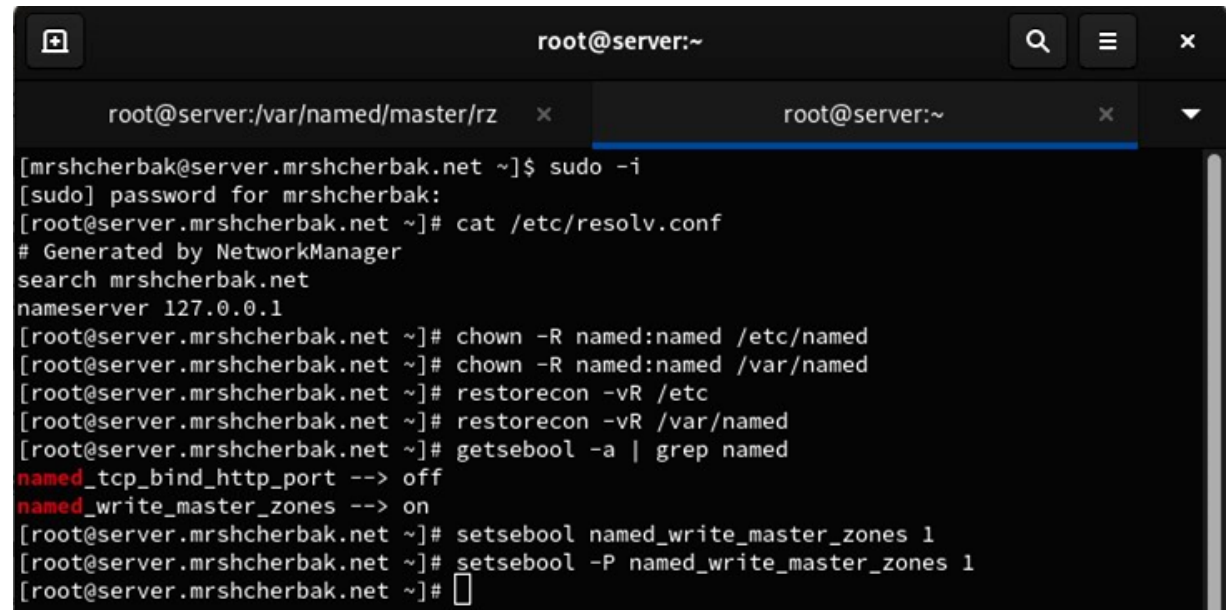
Скопировала шаблон обратной DNS-зоны named.loopback из каталога /var/named в каталог /var/named/master/rz и переименовала его в 192.168.1

```
[root@server.mrshcherbak.net fz]# cp /var/named/named.loopback /var/named/master/rz/
[root@server.mrshcherbak.net fz]# cd /var/named/master/rz/
[root@server.mrshcherbak.net rz]# mv named.loopback 192.168.1
[root@server.mrshcherbak.net rz]#
```


Редактирование файла /var/named/master/rz/192.168.1



```
mc [root@server.mrshcherbak.net]:/var/named/master/rz
192.168.1 [-M--] 0 L: [ 1+13 14/ 14] *(272 / 272b) <EOF> [*] [X]
$TTL 1D
@<----->IN SOA<----->@ server.mrshcherbak.net. (
<-----><----->2020110500<----->; serial
<-----><----->1D<-----><----->; refresh
<-----><----->1H<-----><----->; retry
<-----><----->1W<-----><----->; expire
<-----><----->3H )<-----><----->; minimum
<----->NS<----->@
<----->A<----->192.168.1.1
<----->PTR<----->server.mrshcherbak.net.
$ORIGIN 1.168.192.in-addr.arpa.
1<----->PTR<-----><----->server.mrshcherbak.net.
1<----->PTR<-----><----->ns.mrshcherbak.net.
```



```
root@server:~
root@server:/var/named/master/rz
[mrshcherbak@server.mrshcherbak.net ~]$ sudo -i
[sudo] password for mrshcherbak:
[root@server.mrshcherbak.net ~]# cat /etc/resolv.conf
# Generated by NetworkManager
search mrshcherbak.net
nameserver 127.0.0.1
[root@server.mrshcherbak.net ~]# chown -R named:named /etc/named
[root@server.mrshcherbak.net ~]# chown -R named:named /var/named
[root@server.mrshcherbak.net ~]# restorecon -vR /etc
[root@server.mrshcherbak.net ~]# restorecon -vR /var/named
[root@server.mrshcherbak.net ~]# getsebool -a | grep named
named_tcp_bind_http_port --> off
named_write_master_zones --> on
[root@server.mrshcherbak.net ~]# setsebool named_write_master_zones 1
[root@server.mrshcherbak.net ~]# setsebool -P named_write_master_zones 1
[root@server.mrshcherbak.net ~]#
```

Выполнение команды journalctl -x -f

```
root@server:~  
[mrshcherbak@server.mrshcherbak.net ~]$ sudo -i  
[sudo] password for mrshcherbak:  
[root@server.mrshcherbak.net ~]# journalctl -x -f  
Nov 09 13:59:34 server.mrshcherbak.net named[12200]: network unreachable resolving 'e.ntp  
ns.org/AAAA/IN': 2a03:b0c0:2:d0::20:1001#53  
Nov 09 13:59:34 server.mrshcherbak.net named[12200]: network unreachable resolving 'e.ntp  
ns.org/A/IN': 2a03:b0c0:3:d0::c0:4001#53  
Nov 09 13:59:34 server.mrshcherbak.net named[12200]: network unreachable resolving 'e.ntp  
ns.org/AAAA/IN': 2a03:b0c0:3:d0::c0:4001#53  
Nov 09 13:59:34 server.mrshcherbak.net named[12200]: network unreachable resolving 'ns3.u  
s.bitnames.com/A/IN': 2400:6180:0:d0::16e6:2001#53  
Nov 09 13:59:34 server.mrshcherbak.net named[12200]: network unreachable resolving 'ns3.u  
s.bitnames.com/AAAA/IN': 2400:6180:0:d0::16e6:2001#53
```

Анализ работы DNS-сервера

Описание DNS-зоны с сервера
ns.mrshcherbak.net

```
[root@server.mrshcherbak.net ~]# dig ns.mrshcherbak.net  
  
; <<>> DiG 9.16.23-RH <<>> ns.mrshcherbak.net  
;; global options: +cmd  
;; Got answer:  
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 56656  
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  
  
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags:; udp: 1232  
; COOKIE: 3a3f8e6962a97a3301000000654ce729a9300a5599d5ee20 (good)  
;; QUESTION SECTION:  
ns.mrshcherbak.net.      IN      A  
  
;; ANSWER SECTION:  
ns.mrshcherbak.net.      86400   IN      A      192.168.1.1  
  
;; Query time: 0 msec  
;; SERVER: 127.0.0.1#53(127.0.0.1)  
;; WHEN: Thu Nov 09 14:05:29 UTC 2023  
;; MSG SIZE rcvd: 91  
  
[root@server.mrshcherbak.net ~]#
```

При помощи утилиты host проанализировала корректность работы DNS-сервера

```
[root@server.mrshcherbak.net ~]# host -l mrshcherbak.net
mrshcherbak.net name server mrshcherbak.net.
mrshcherbak.net has address 192.168.1.1
ns.mrshcherbak.net has address 192.168.1.1
server.mrshcherbak.net has address 192.168.1.1
[root@server.mrshcherbak.net ~]# host -a mrshcherbak.net
Trying "mrshcherbak.net"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 58296
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 1

;; QUESTION SECTION:
;mrshcherbak.net.                IN      ANY

;; ANSWER SECTION:
mrshcherbak.net.      86400   IN      SOA     mrshcherbak.net. server.mrshcherbak.net.
2020110500 86400 3600 604800 10800
mrshcherbak.net.      86400   IN      NS      mrshcherbak.net.
mrshcherbak.net.      86400   IN      A       192.168.1.1

;; ADDITIONAL SECTION:
mrshcherbak.net.      86400   IN      A       192.168.1.1

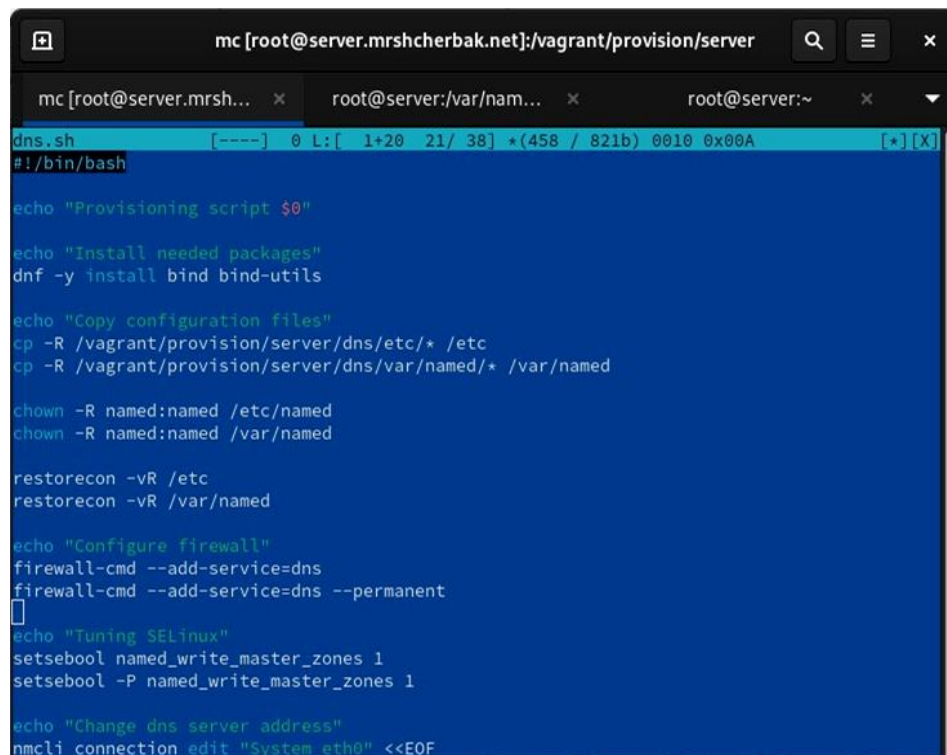
Received 122 bytes from 127.0.0.1#53 in 25 ms
```

```
[root@server.mrshcherbak.net ~]# host -t A mrshcherbak.net
mrshcherbak.net has address 192.168.1.1
[root@server.mrshcherbak.net ~]# host -t PTR 192.168.1.1
1.1.168.192.in-addr.arpa domain name pointer server.mrshcherbak.net.
1.1.168.192.in-addr.arpa domain name pointer ns.mrshcherbak.net.
[root@server.mrshcherbak.net ~]#
```


Внесение изменений в настройки внутреннего окружения виртуальной машины

```
[root@server.mrshcherbak.net ~]# cd /vagrant
[root@server.mrshcherbak.net vagrant]# mkdir -p /vagrant/provision/server/dns/etc/named
[root@server.mrshcherbak.net vagrant]# mkdir -p /vagrant/provision/server/dns/var/named/master/
[root@server.mrshcherbak.net vagrant]# cp -R /etc/named.conf /vagrant/provision/server/dns/etc/
[root@server.mrshcherbak.net vagrant]# cp -R /etc/named/* /vagrant/provision/server/dns/etc/named/
[root@server.mrshcherbak.net vagrant]# cp -R /var/named/master/* /vagrant/provision/server/dns/var/named/master/
[root@server.mrshcherbak.net vagrant]#
```

Содержимое файла dns.sh



The screenshot shows a terminal window with the title bar "mc [root@server.mrshcherbak.net]:/vagrant/provision/server". The terminal displays the content of the file "dns.sh" which includes commands for installing bind, copying configuration files, setting permissions, and configuring the firewall and SELinux.

```
mc [root@server.mrshcherbak.net]:/vagrant/provision/server
mc [root@server.mrshcherbak.net]:/vagrant/provision/server
root@server:/var/named
root@server:~
dns.sh [-----] 0 L:[ 1+20 21/ 38] *(458 / 821b) 0010 0x00A [*][X]
#!/bin/bash

echo "Provisioning script $0"

echo "Install needed packages"
dnf -y install bind bind-utils

echo "Copy configuration files"
cp -R /vagrant/provision/server/dns/etc/* /etc
cp -R /vagrant/provision/server/dns/var/named/* /var/named

chown -R named:named /etc/named
chown -R named:named /var/named

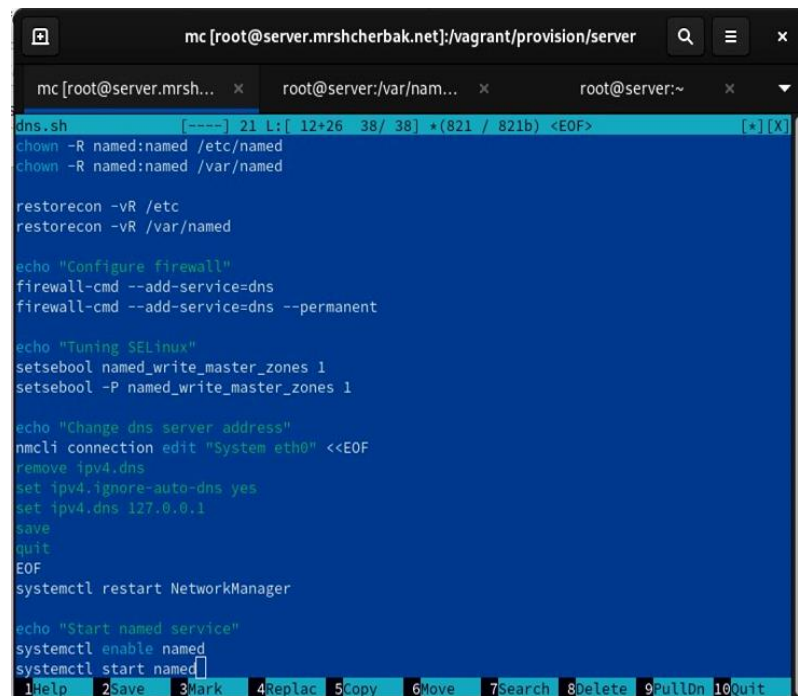
restorecon -vR /etc
restorecon -vR /var/named

echo "Configure firewall"
firewall-cmd --add-service=dns
firewall-cmd --add-service=dns --permanent

echo "Tuning SELinux"
setsebool named_write_master_zones 1
setsebool -P named_write_master_zones 1

echo "Change dns server address"
nmcli connection edit "System eth0" <<EOF
remove ipv4.dns
set ipv4.ignore-auto-dns yes
set ipv4.dns 127.0.0.1
save
quit
EOF
systemctl restart NetworkManager

echo "Start named service"
systemctl enable named
systemctl start named
```



The screenshot shows a terminal window with the title bar "mc [root@server.mrshcherbak.net]:/vagrant/provision/server". The terminal displays the content of the file "dns.sh" which includes commands for installing bind, copying configuration files, setting permissions, and configuring the firewall and SELinux.

```
mc [root@server.mrshcherbak.net]:/vagrant/provision/server
mc [root@server.mrshcherbak.net]:/vagrant/provision/server
root@server:/var/named
root@server:~
dns.sh [-----] 21 L:[ 12+26 38/ 38] *(821 / 821b) <EOF> [*][X]
chown -R named:named /etc/named
chown -R named:named /var/named

restorecon -vR /etc
restorecon -vR /var/named

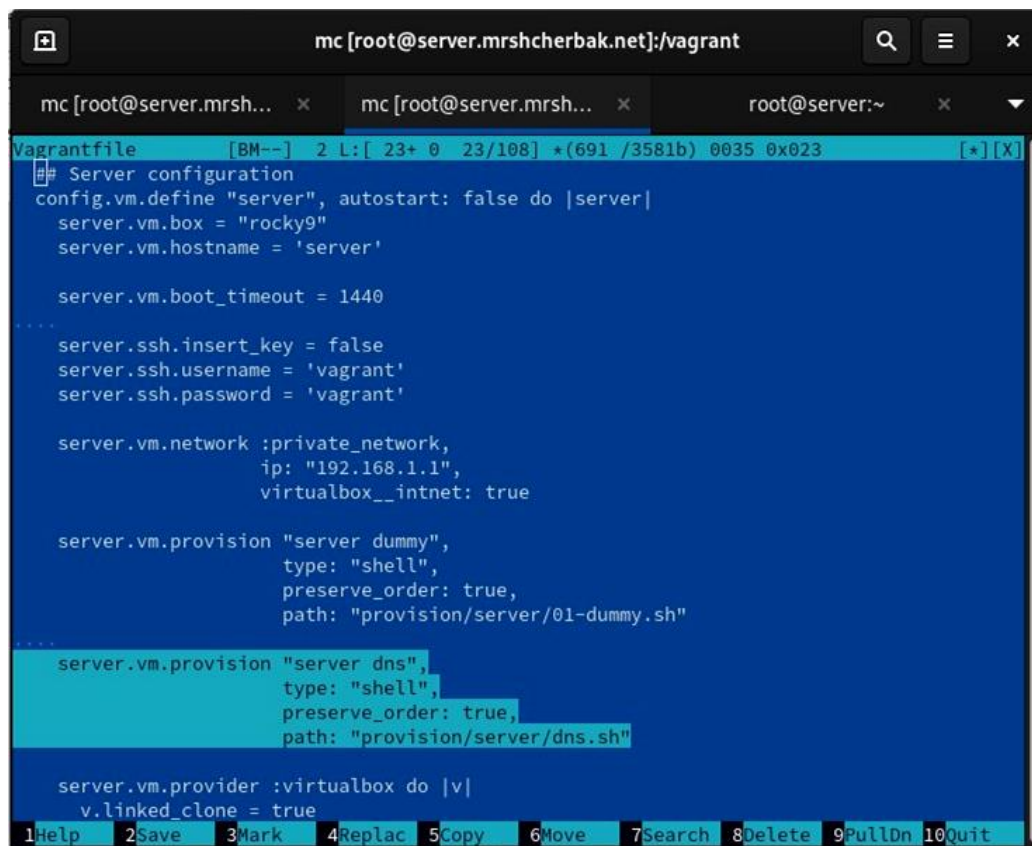
echo "Configure firewall"
firewall-cmd --add-service=dns
firewall-cmd --add-service=dns --permanent

echo "Tuning SELinux"
setsebool named_write_master_zones 1
setsebool -P named_write_master_zones 1

echo "Change dns server address"
nmcli connection edit "System eth0" <<EOF
remove ipv4.dns
set ipv4.ignore-auto-dns yes
set ipv4.dns 127.0.0.1
save
quit
EOF
systemctl restart NetworkManager

echo "Start named service"
systemctl enable named
systemctl start named
1Help 2Save 3Mark 4Replac 5Copy 6Move 7Search 8Delete 9PullOn 10Quit
```

Редактирование файла Vagrantfile



```
mc [root@server.mrshcherbak.net]:/vagrant
Vagrantfile [BM--] 2 L: [ 23+ 0 23/108] *(691 /3581b) 0035 0x023 [*] [X]
# Server configuration
config.vm.define "server", autostart: false do |server|
  server.vm.box = "rocky9"
  server.vm.hostname = 'server'

  server.vm.boot_timeout = 1440
  ....
  server.ssh.insert_key = false
  server.ssh.username = 'vagrant'
  server.ssh.password = 'vagrant'

  server.vm.network :private_network,
    ip: "192.168.1.1",
    virtualbox____intnet: true

  server.vm.provision "server dummy",
    type: "shell",
    preserve_order: true,
    path: "provision/server/01-dummy.sh"
  ....
  server.vm.provision "server dns",
    type: "shell",
    preserve_order: true,
    path: "provision/server/dns.sh"

  server.vm.provider :virtualbox do |v|
    v.linked_clone = true
  end
end
```

Вывод: таким образом, в ходе выполнения л/р №2, я приобрела практические навыки по установке и конфигурированию DNS-сервера, усвоила принципы работы системы доменных имён.