

Лабораторная работа №2

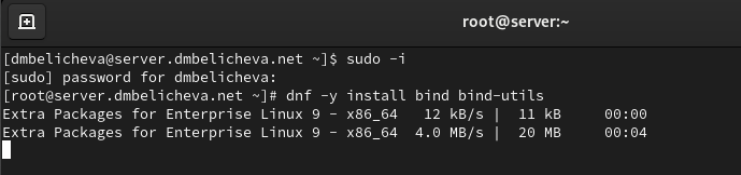
Настройка DNS-сервера

Беличева Дарья Михайловна

Российский университет дружбы народов, Москва, Россия

Приобрести практические навыки по установке и конфигурированию DNS-сервера, усвоить принципы работы системы доменных имён.

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



```
root@server:~  
[dmbelicheva@server.dmbelicheva.net ~]$ sudo -i  
[sudo] password for dmbelicheva:  
[root@server.dmbelicheva.net ~]# dnf -y install bind bind-utils  
Extra Packages for Enterprise Linux 9 - x86_64 12 kB/s | 11 kB 00:00  
Extra Packages for Enterprise Linux 9 - x86_64 4.0 MB/s | 20 MB 00:04  
█
```

Рис. 1: Установка bind и bind-utils в режиме суперпользователя

С помощью утилиты dig сделаем запрос к DNS-адресу www.yandex.ru:

```
[root@server.dmbelicheva.net ~]# dig www.yandex.ru

; <<> DiG 9.16.23-RH <<> www.yandex.ru
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 5977
;; 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: 10 msec
;; SERVER: 10.0.2.3#53(10.0.2.3)
;; WHEN: Sat Nov 11 14:16:24 UTC 2023
;; MSG SIZE rcvd: 95
```

Рис. 2: Команда dig

```
[root@server.dmbelicheva.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> remove ipv4.dns
nmcli> set ipv4.ignore-auto-dns yes
nmcli> set ipv4.dns 127.0.0.1
nmcli> save
Connection 'eth0' (d18d46cb-18cd-4f51-bb7b-4c35caa7c786) successfully updated.
nmcli> quit
[root@server.dmbelicheva.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' (5fb86bd0-0bb0-7ffb-45f1-d6edd05f3e83) successfully updated.
nmcli> quit
[root@server.dmbelicheva.net ~]#
```

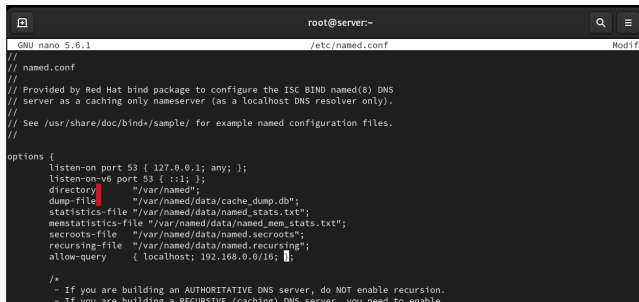
Рис. 3: Изменение адреса dns-сервера

```
[root@server.dmbelicheva.net ~]# systemctl restart NetworkManager
[root@server.dmbelicheva.net ~]# cat /etc/resolv.conf
# Generated by NetworkManager
search dmbelicheva.net
nameserver 127.0.0.1
[root@server.dmbelicheva.net ~]# mc /etc/named.conf
```

Рис. 4: Изменение адреса dns-сервера

Выполнение лабораторной работы

Настроим направление DNS-запросов от всех узлов внутренней сети, включая запросы от узла server, через узел server. Для этого внесем изменения в файл `/etc/named.conf`:



```
root@server:~  
GNU nano 5.6.1 /etc/named.conf Modified  
//  
// 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.secroots";  
    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 recursion.  
    - If you are building a RECURSIVE (caching) DNS server, you need to enable
```

Рис. 5: Изменение скрипта

Выполнение лабораторной работы

Внесем изменения в настройки межсетевого экрана узла server, разрешив работу с DNS и убедимся, что DNS-запросы идут через узел server, который прослушивает порт 53:

```
[root@server.dmbelicheva.net ~]# firewall-cmd --add-service=dns
success
[root@server.dmbelicheva.net ~]# firewall-cmd --add-service=dns --permanent
success
[root@server.dmbelicheva.net ~]# ss -t | grep UDP
ss: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1001/gvfs
Output information may be incomplete.
avahi-daemon 562          avahi 12u      IPv4      18760     0t0      UDP *:mdns
avahi-daemon 562          avahi 13u      IPv6      18761     0t0      UDP *:mdns
avahi-daemon 562          avahi 14u      IPv4      18762     0t0      UDP *:46522
avahi-daemon 562          avahi 15u      IPv6      18763     0t0      UDP *:45440
chronyd 586          chrony 5u        IPv4      18658     0t0      UDP localhost:323
chronyd 586          chrony 6u        IPv6      18659     0t0      UDP localhost:323
named 8308          named 16u      IPv4      56604     0t0      UDP localhost:domain
named 8308          named 19u      IPv6      56606     0t0      UDP localhost:domain
named 8308 8309 isc-net-0 named 16u      IPv4      56604     0t0      UDP localhost:domain
named 8308 8309 isc-net-0 named 19u      IPv6      56606     0t0      UDP localhost:domain
named 8308 8310 isc-timer named 16u      IPv4      56604     0t0      UDP localhost:domain
named 8308 8310 isc-timer named 19u      IPv6      56606     0t0      UDP localhost:domain
named 8308 8311 isc-socket named 16u      IPv4      56604     0t0      UDP localhost:domain
named 8308 8311 isc-socket named 19u      IPv6      56606     0t0      UDP localhost:domain
named 8308 8349 isc-net-0 named 16u      IPv4      56604     0t0      UDP localhost:domain
named 8308 8349 isc-net-0 named 19u      IPv6      56606     0t0      UDP localhost:domain
NetworkManager 8831      root 27u      IPv4      66911     0t0      UDP server.dmbelicheva
net:bootpc->_gateway:bootps
NetworkManager 8831 8837 gmain      root 27u      IPv4      66911     0t0      UDP server.dmbelicheva
net:bootpc->_gateway:bootps
NetworkManager 8831 8838 gdbus      root 27u      IPv4      66911     0t0      UDP server.dmbelicheva
net:bootpc->_gateway:bootps
```

Рис. 6: Внесение изменений

В случае возникновения в сети ситуации, когда DNS-запросы от сервера фильтруются сетевым оборудованием, следует добавить перенаправление DNS-запросов на конкретный вышестоящий DNS-сервер. Для этого в конфигурационный файл `named.conf` в секцию `options` следует добавить:

Выполнение лабораторной работы

```
root@server:~  
GNU nano 5.6.1 /etc/named.conf  
//  
// 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.secroots";  
    recursing-file "/var/named/data/named.recursing";  
    allow-query { localhost; 192.168.0.0/16; };  
    forwarders {192.168.1.1; }  
    forward first  
  
    /*  
    - If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.  
    - If you are building a RECURSIVE (caching) DNS server, you need to enable  
      recursion.  
    - If your recursive DNS server has a public IP address, you MUST enable access  
      control to limit queries to your legitimate users. Failing to do so will  
      cause your server to become part of large scale DNS amplification  
      attacks. Implementing BCP38 within your network would greatly  
      reduce such attack surface  
    */  
    recursion yes;  
  
    dnssec-enable no;  
    dnssec-validation no;
```

Конфигурирование первичного DNS-сервера

```
[root@server.dmbelicheva.net ~]# nano /etc/named.conf
[root@server.dmbelicheva.net ~]# cp /etc/named.rfc1912.zones /etc/named/
[root@server.dmbelicheva.net ~]# cd /etc/named
[root@server.dmbelicheva.net named]# mv /etc/named/named.rfc1912.zones /etc/named/dmbelicheva.net
[root@server.dmbelicheva.net named]# ls
dmbelicheva.net
```

Рис. 8: Окно терминала

Выполнение лабораторной работы

```
root@server:/etc/named
GNU nano 5.6.1 /etc/named.conf
recursing-file "/var/named/data/named.recursing";
allow-query { localhost; 192.168.0.0/16; };
forwarders {192.168.1.1; }
forward first

/*
- If you are building an AUTHORITATIVE DNS server, do NOT enable recursion.
- If you are building a RECURSIVE (caching) DNS server, you need to enable
  recursion.
- If your recursive DNS server has a public IP address, you MUST enable access
  control to limit queries to your legitimate users. Failing to do so will
  cause your server to become part of large scale DNS amplification
  attacks. Implementing BCP38 within your network would greatly
  reduce such attack surface
*/
recursion yes;

dnsssec-enable no;
dnsssec-validation no;

managed-keys-directory "/var/named/dynamic";
geoip-directory "/usr/share/GeoIP";

pid-file "/run/named/named.pid";
session-keyfile "/run/named/session.key";

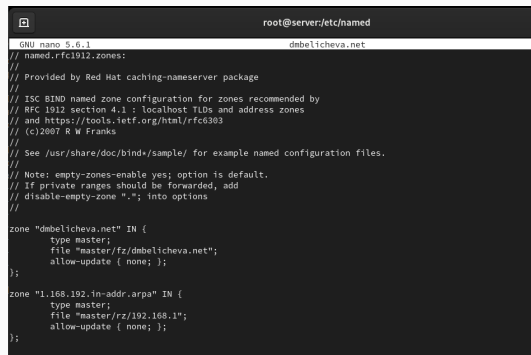
/* https://fedoraproject.org/wiki/Changes/CryptoPolicy */
include "/etc/crypto-policies/back-ends/bind.config";
};

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/dmbelicheva.net"
```

Внесём изменения в файл dmbelicheva.net:



```
root@server:/etc/named
GNU nano 5.6.1 dmbelicheva.net
// named.rfc1912.zones:
//
// Provided by Red Hat caching-nameserver package
//
// ISC BIND named zone configuration for zones recommended by
// RFC 1912 section 4.1 : localhost TLDs and address zones
// and https://tools.ietf.org/html/rfc6303
// (c)2007 R W Franks
//
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
// Note: empty-zones-enable yes; option is default.
// If private ranges should be forwarded, add
// disable-empty-zone "."; into options
//
zone "dmbelicheva.net" IN {
    type master;
    file "master/fz/dmbelicheva.net";
    allow-update { none; };
};

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

Рис. 10: Изменение скрипта

```
[root@server.dmbelicheva.net named]# cd /var/named
[root@server.dmbelicheva.net named]# mkdir -p /var/named/master/fz
[root@server.dmbelicheva.net named]# mkdir -p /var/named/master/rz
[root@server.dmbelicheva.net named]# cp /var/named/named.localhost /var/named/master/fz/
[root@server.dmbelicheva.net named]# cd /var/named/master/fz/
[root@server.dmbelicheva.net fz]# mv named.localhost dmbelicheva.net
[root@server.dmbelicheva.net fz]# nano dmbelicheva.net
```

Рис. 11: Изменение скрипта

Изменим файл `/var/named/master/fz/user.net`, указав необходимые DNS-записи для прямой зоны:

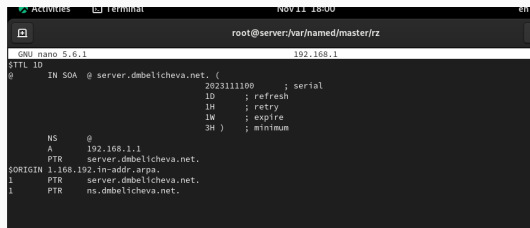


```
root@server:/var/named/master/fz
GNU nano 5.6.1 dmbelicheva.net
$TTL 1D
@      IN SOA  @ server.dmbelicheva.net. (
                                2023111100 ; serial
                                1D      ; refresh
                                1H      ; retry
                                1W      ; expire
                                3H )    ; minimum

      NS   @
      A    192.168.1.1
$ORIGIN dmbelicheva.net.
server A    192.168.1.1
ns     A    192.168.1.1
```

Рис. 12: Изменение скрипта

Скопируем шаблон обратной DNS-зоны `named.loopback` из каталога `/var/named` в каталог `/var/named/master/rz` и переименуем его в `192.168.1`, а также изменим файл:



```
Activities Terminal Nov 11 18:00 en
root@server:/var/named/master/rz

GNU nano 5.6.1 192.168.1
$TTL 1D
@      IN  SOA  @  server.dmbelicheva.net. (
                                2023111100      ; serial
                                1D      ; refresh
                                1H      ; retry
                                1W      ; expire
                                3H )   ; minimum

      NS      @
      A      192.168.1.1
      PTR     server.dmbelicheva.net.
$ORIGIN 1.168.192.in-addr.arpa.
1      PTR     server.dmbelicheva.net.
1      PTR     ns.dmbelicheva.net.
```

Рис. 13: Изменение скрипта

```
[root@server.dmbelicheva.net rz]# chown -R named:named /etc/named
[root@server.dmbelicheva.net rz]# chown -R named:named /var/named
[root@server.dmbelicheva.net rz]# restorecon -vR /etc
Relabeled /etc/sysconfig/network-scripts/ifcfg-eth1 from unconfined_u:object_r:user_tmp_t:s0 to unconfined_u:object_r:net_conf_t:s0
[root@server.dmbelicheva.net rz]# restorecon -vR /var/named
[root@server.dmbelicheva.net rz]# getsebool -a | grep named
named_tcp_bind_http_port --> off
named_write_master_zones --> on
```

Рис. 14: Восстановление меток безопасности и проверка состояния переключателей в SELinux

Выполнение лабораторной работы

В дополнительном терминале запустим в режиме реального времени расширенный лог системных сообщений, чтобы проверить корректность работы системы:

```

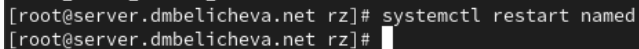
dmbelicheva@server:~ — journalctl -x -f
3
Nov 11 18:37:30 server.dmbelicheva.net gnome-shell[5218]: Can't update stage views actor MetaWindowGroup is on
se it needs an allocation.
Nov 11 18:37:30 server.dmbelicheva.net gnome-shell[5218]: Can't update stage views actor MetaWindowActorX11 is
cause it needs an allocation.
Nov 11 18:37:30 server.dmbelicheva.net gnome-shell[5218]: Can't update stage views actor MetaSurfaceActorX11 f
ecause it needs an allocation.
^C
[dmbelicheva@server.dmbelicheva.net ~]$ journalctl -x -f
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: network unreachable resolving './DNSKEY/IN': 2001:500:11:
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: managed-keys-zone: Key 20326 for zone . is now trusted (a
nce timer complete)
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: timed out resolving './DNSKEY/IN': 192.168.1.1#53
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: network unreachable resolving './DNSKEY/IN': 2001:503:ba3
0#53
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: network unreachable resolving './DNSKEY/IN': 2001:503:c27
#53
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: network unreachable resolving './DNSKEY/IN': 2001:500:2f:
Nov 11 18:37:26 server.dmbelicheva.net named[10912]: network unreachable resolving './DNSKEY/IN': 2001:500:12:
3
Nov 11 18:37:30 server.dmbelicheva.net gnome-shell[5218]: Can't update stage views actor MetaWindowGroup is on
se it needs an allocation.
Nov 11 18:37:30 server.dmbelicheva.net gnome-shell[5218]: Can't update stage views actor MetaWindowActorX11 is
cause it needs an allocation.
Nov 11 18:37:30 server.dmbelicheva.net gnome-shell[5218]: Can't update stage views actor MetaSurfaceActorX11 f
ecause it needs an allocation.
Nov 11 18:40:12 server.dmbelicheva.net systemd[1]: Starting dnf makecache...
  Subject: A start job for unit dnf-makecache.service has begun execution
  Defined-By: systemd
  Support: https://access.redhat.com/support

  A start job for unit dnf-makecache.service has begun execution.

  The job Identifier is 4740.
Nov 11 18:40:14 server.dmbelicheva.net dnf[10949]: Metadata timer caching disabled when running on a battery.
Nov 11 18:40:14 server.dmbelicheva.net systemd[1]: dnf-makecache.service: Deactivated successfully.
  Subject: Unit succeeded
  Defined-By: systemd
  Support: https://access.redhat.com/support

  The unit dnf-makecache.service has successfully entered the 'dead' state.
Nov 11 18:40:14 server.dmbelicheva.net systemd[1]: Finished dnf makecache.
  Subject: A start job for unit dnf-makecache.service has finished successfully
  Defined-By: systemd
```

В случае ошибок перезапустим DNS-сервер:

A terminal window with a dark background. The prompt is [root@server.dmbelicheva.net rz]#. The command systemctl restart named is entered. The prompt is shown again on the next line with a white cursor.

```
[root@server.dmbelicheva.net rz]# systemctl restart named  
[root@server.dmbelicheva.net rz]#
```

Рис. 16: Перезапуск сервера

Анализ работы DNS-сервера

```
[root@server.dmbelicheva.net rz]# dig ns.dmbelicheva.net

; <<>> DiG 9.16.23-RH <<>> ns.dmbelicheva.net
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 7956
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: 28d93565e735d0fc01000000654fcb0040c5e70b1bf52b62 (good)
;; QUESTION SECTION:
;ns.dmbelicheva.net.          IN      A

;; ANSWER SECTION:
ns.dmbelicheva.net.  86400  IN      A      192.168.1.1

;; Query time: 2 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Sat Nov 11 18:42:08 UTC 2023
;; MSG SIZE rcvd: 91
```

Рис. 17: Утилита dig

При помощи утилиты `host` проанализируем корректность работы DNS-сервера, можно увидеть, что все внесённые нами изменения в работу сервера учтены:

```
[root@server.dmbelicheva.net rz]# host -l dmbelicheva.net
dmbelicheva.net name server dmbelicheva.net.
dmbelicheva.net has address 192.168.1.1
ns.dmbelicheva.net has address 192.168.1.1
server.dmbelicheva.net has address 192.168.1.1
[root@server.dmbelicheva.net rz]# host -a dmbelicheva.net
Trying "dmbelicheva.net"
;; -->HEADER<-- opcode: QUERY, status: NOERROR, id: 28251
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 1

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

;; ANSWER SECTION:
dmbelicheva.net.      86400   IN      SOA     dmbelicheva.net. server.dmbelicheva.net. 2023111100 86400 3600 60480
0 10800
dmbelicheva.net.      86400   IN      NS      dmbelicheva.net.
dmbelicheva.net.      86400   IN      A       192.168.1.1

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

Received 122 bytes from 127.0.0.1#53 in 8 ms
[root@server.dmbelicheva.net rz]# host -t A dmbelicheva.net
dmbelicheva.net has address 192.168.1.1
[root@server.dmbelicheva.net rz]# host -t PTR 192.168.1.1
1.1.168.192.in-addr.arpa domain name pointer server.dmbelicheva.net.
1.1.168.192.in-addr.arpa domain name pointer ns.dmbelicheva.net.
[root@server.dmbelicheva.net rz]#
```

Рис. 18: Утилита `host`

Внесение изменений в настройки внутреннего окружения виртуальной машины

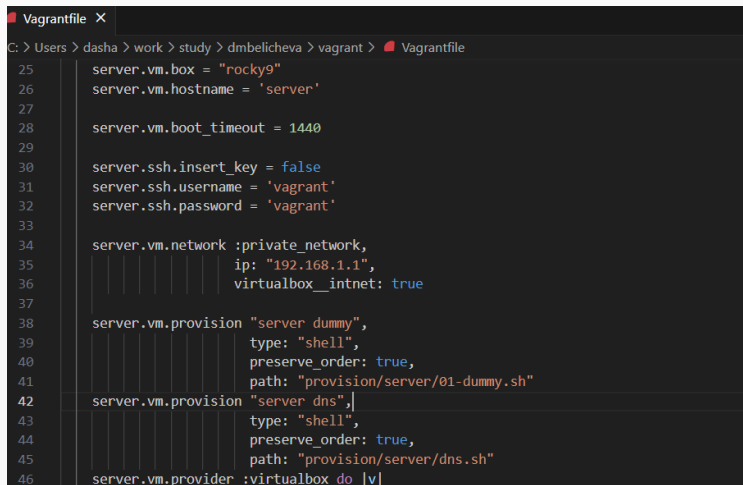
```
11.190.192:~$ ssh -t vagrant@server.dmbelicheva.net
[root@server.dmbelicheva.net rz]# cd /vagrant
[root@server.dmbelicheva.net vagrant]# mkdir -p /vagrant/provision/server/dns/etc/named
[root@server.dmbelicheva.net vagrant]# mkdir -p /vagrant/provision/server/dns/var/named/master/
[root@server.dmbelicheva.net vagrant]# cp -R /etc/named.conf /vagrant/provision/server/dns/etc/
[root@server.dmbelicheva.net vagrant]# cp -R /etc/named/* /vagrant/provision/server/dns/etc/named/
[root@server.dmbelicheva.net vagrant]# cp -R /var/named/master/* /vagrant/provision/server/dns/var/named/master/
[root@server.dmbelicheva.net vagrant]# cd /vagrant/provision/server
[root@server.dmbelicheva.net server]# touch dns.sh
[root@server.dmbelicheva.net server]# chmod +x dns.sh
[root@server.dmbelicheva.net server]# nano dns.sh
```

Рис. 19: Создание каталога dns и перенос в него файлов, создание dns.sh

Выполнение лабораторной работы

```
root@server:/vagrant/provision/server
GNU nano 5.6.1 dns.sh
#!/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
```


Выполнение лабораторной работы



The image shows a code editor window titled "Vagrantfile X". The editor displays a Vagrantfile configuration for a virtual machine named "rocky9". The configuration includes settings for the VM box, hostname, boot timeout, SSH settings, network configuration, and two provision scripts. The file path shown in the title bar is "C:\Users\dasha\work\study\dmbelicheva\vagrant\Vagrantfile".

```
25     server.vm.box = "rocky9"
26     server.vm.hostname = 'server'
27
28     server.vm.boot_timeout = 1440
29
30     server.ssh.insert_key = false
31     server.ssh.username = 'vagrant'
32     server.ssh.password = 'vagrant'
33
34     server.vm.network :private_network,
35     |               | ip: "192.168.1.1",
36     |               | virtualbox__intnet: true
37
38     server.vm.provision "server dummy",
39     |               | type: "shell",
40     |               | preserve_order: true,
41     |               | path: "provision/server/01-dummy.sh"
42     server.vm.provision "server dns",
43     |               | type: "shell",
44     |               | preserve_order: true,
45     |               | path: "provision/server/dns.sh"
46     server.vm.provider :virtualbox do |v|
```

Рис. 21: Изменение Vagrantfile

В процессе выполнения данной лабораторной работы я приобрела практические навыки по установке и конфигурированию DNS-сервера, усвоила принципы работы системы доменных имён.