

Администрирование сетевых подсистем

Лабораторная работа №2

Машков И. Е.

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Российский университет дружбы народов, Москва, Россия

Информация

- Машков Илья Евгеньевич
- Студент 3-го курса, группа НФИбд-02-23
- Российский университет дружбы народов
- 1132231984@pfur.ru
- <https://github.com/7S7eVe7N7>

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

```
[user@server ~]$ 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 user:
[root@server ~]# dnf -y install bind bind-utils
Extra Packages for Enterprise Linux 9 - x86_64 119 kB/s | 34 kB    00:00
```

Рис. 1: Установка bind и bind-utils

Выполнение лабораторной работы

```
[root@server ~]# 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, link, 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' (52b757e4-3833-4753-b0eb-de0af7f26f57) successfully updated.
nmcli> quit
[root@server ~]# 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, link, tc, proxy
nmcli> ^C
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 updated.
nmcli> quit
[root@server ~]#
```

Рис. 2: Установка dns-сервера, как основного для хоста

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

Рис. 3: Перезапуск сети и проверка изменений

```
options {  
    listen-on port 53 { 127.0.0.1; any; };  
    listen-on-v6 port 53 { ::1; };  
    directory      "/var/named";  
    dump-file      I  "/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; };
```

Рис. 4: Настройка направления для DNS-запросов

Выполнение лабораторной работы

```
[root@server etc]# nano /etc/named.conf
[root@server etc]# firewall-cmd --add-service-dns
success
[root@server etc]# firewall-cmd --add-service-dns --permanent
success
[root@server etc]# lsuf | grep UDP
lsuf: WARNING: can't stat() fuse.gvfsd-fuse file system /run/user/1001/gvfs
Output information may be incomplete.
avaht-dae 685          avah1 12u  IPv4  19305      0t0  UDP  *:mdns
avaht-dae 685          avah1 13u  IPv6  19306      0t0  UDP  *:mdns
avaht-dae 685          avah1 14u  IPv4  19307      0t0  UDP  *:5695
avaht-dae 685          avah1 15u  IPv6  19308      0t0  UDP  *:48579
chronyd  615             chrony 5u   IPv4  19161      0t0  UDP  localhost:323
chronyd  615             chrony 6u   IPv6  19162      0t0  UDP  localhost:323
named    6996             named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996             named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996             named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996             named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 6997 tsc-net-0  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 6997 tsc-net-0  named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996 6997 tsc-net-0  named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996 6997 tsc-net-0  named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 6998 tsc-net-0  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 6998 tsc-net-0  named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996 6998 tsc-net-0  named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996 6998 tsc-net-0  named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 6999 tsc-net-0  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 6999 tsc-net-0  named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996 6999 tsc-net-0  named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996 6999 tsc-net-0  named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 7000 tsc-net-0  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 7000 tsc-net-0  named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996 7000 tsc-net-0  named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996 7000 tsc-net-0  named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 7001 tsc-timer  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 7001 tsc-timer  named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996 7001 tsc-timer  named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996 7001 tsc-timer  named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 7002 tsc-socke  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 7002 tsc-socke  named 33u  IPv4  36778      0t0  UDP  localhost:domain
named    6996 7002 tsc-socke  named 38u  IPv6  36781      0t0  UDP  localhost:domain
named    6996 7002 tsc-socke  named 39u  IPv6  36782      0t0  UDP  localhost:domain
named    6996 7003 tsc-socke  named 32u  IPv4  36777      0t0  UDP  localhost:domain
named    6996 7003 tsc-socke  named 33u  IPv4  36778      0t0  UDP  localhost:domain
```

Рис. 5: Внесение изменений в настройки межсетевого экрана

```
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;
```

Рис. 6: Добавление перенаправления для DNS-запросов

```
*/  
recursion yes;  
  
dnssec-enable no;  
dnssec-validation no;
```

Рис. 7: Отключение DNSSEC

```
GNU nano 5.6.1
$TTL 1D
@      IN SOA      @ server.user.net. (
        2024072700      ; serial
        1D              ; refresh
        1H              ; retry
        1W              ; expire
        3H )            ; minimum
        NS              @
        A 192.168.1.1
$ORIGIN user.net.
server A 192.168.1.1
ns     A 192.168.1.1
```

Рис. 8: Измнения в файле user.net

```
GNU nano 5.6.1                                     192.168.1
$TTL 1D
@      IN SOA  @ server.user.net. (
                                2023072700      ; serial
                                1D      ; refresh
                                1H      ; retry
                                1W      ; expire
                                3H )   ; minimum

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

Рис. 9: Изменения в файле обратной зоны

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

; <<>> DiG 9.16.23-RH <<>> ns.user.net
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 61919
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
; COOKIE: a72f90288f3a5de601000000690f71125f2140c51514e9b9 (good)
;; QUESTION SECTION:
;ns.user.net.                IN      A

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

;; Query time: 1 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Sat Nov 08 16:34:26 UTC 2025
;; MSG SIZE rcvd: 84

[root@server rz]#
```

Рис. 10: Описание DNS-зоны ns.user.net

```
[root@server rz]# host -l user.net
user.net name server user.net.
user.net has address 192.168.1.1
ns.user.net has address 192.168.1.1
server.user.net has address 192.168.1.1
[root@server rz]# host -a user.net
Trying "user.net"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 8364
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 0

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

;; ANSWER SECTION:
user.net.                 86400   IN      SOA     user.net. server.user.net. 2024072700 86400 3600 604800 10800
user.net.                 86400   IN      NS      user.net.
user.net.                 86400   IN      A       192.168.1.1

Received 99 bytes from 127.0.0.1#53 in 6 ms
[root@server rz]# host -t A user.net
user.net has address 192.168.1.1
[root@server rz]# host -t PTR 192.168.1.1
1.1.168.192.in-addr.arpa domain name pointer server.user.net.
1.1.168.192.in-addr.arpa domain name pointer ns.user.net.1.168.192.in-addr.arpa.
[root@server rz]#
```

Рис. 11: Использование утилиты Host

Выполнение лабораторной работы

```
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
```

Рис. 12: dns.sh

```
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
# Customize the amount of memory on the VM
    v.memory = 8192
    v.cpus = 2
    v.name = "server"
# Display the VirtualBox GUI when booting the machine
```

Рис. 13: Внесение изменений в Vagrantfile

Во время выполнения данной лабораторной работы я приобрёл практические навыки по установке и конфигурированию DNS-сервера и усвоил принципы работы системы доменных имён.