

Отчёт о лабораторной работе

Лабораторная работа 3

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Содержание

Цель работы

Приобретение практических навыков по установке и конфигурированию DHCP-сервера.

Выполнение лабораторной работы

Для начала запустим сервер через vagrant (рис. [-@fig:001]).

```
C:\work_asp\dmosharov\vagrant>vagrant up server
Bringing machine 'server' up with 'virtualbox' provider...
==> server: You assigned a static IP ending in ".1" or ".11" 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" or ".11" 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.
```

Запуск сервера

Зайдём под рутом и установим пакет для настройки dhcp - kea (рис. [-@fig:002]).

```
[root@server dmosharov.net ~]# dnf -y install kea
Rocky Linux 10 - BaseOS                               3.1 kB/s | 4.3 kB  00:01
Rocky Linux 10 - AppStream                             5.3 kB/s | 4.3 kB  00:00
Rocky Linux 10 - CRB                                   4.1 kB/s | 4.3 kB  00:01
Rocky Linux 10 - Extras                                3.0 kB/s | 3.1 kB  00:01
Dependencies resolved.
=====
Package                               Architecture Version      Repository      Size
-----
Installing:
kea                                    x86_64      3.0.1-2.el10_1 baseos          1.4 M
Installing dependencies:
kea-tlbs                                x86_64      3.0.1-2.el10_1 baseos          3.1 M
libpq                                   x86_64      16.8-2.el10_0 baseos           255 k
log4cplus                              x86_64      2.1.1-8.el10 baseos           351 k
mariadb-connector-c                     x86_64      3.4.4-1.el10 baseos           206 k
mariadb-connector-c-config              noarch      3.4.4-1.el10 baseos            8.9 k
Transaction Summary
-----
Install 6 Packages

Total download size: 5.3 M
Installed size: 19 M
Downloading Packages:
(1/6): libpq-16.8-2.el10.0.x86_64.rpm                233 kB/s | 255 kB  00:01
(2/6): kea-tlbs-3.0.1-2.el10.1.x86_64.rpm              2.3 MB/s | 3.1 MB  00:01
(3/6): kea-3.0.1-2.el10.1.x86_64.rpm                  915 kB/s | 1.4 MB  00:01
(4/6): mariadb-connector-c-config-3.4.4-1.el10.noarch 31 kB/s | 8.9 kB  00:00
(5/6): log4cplus-2.1.1-8.el10.x86_64.rpm              300 kB/s | 351 kB  00:00
(6/6): mariadb-connector-c-3.4.4-1.el10.x86_64.rpm    276 kB/s | 206 kB  00:00
-----
Total                                           2.1 MB/s | 5.3 MB  00:02
```

Установка kea

Перед изменением конфигурационного файла, на всякий случай сделаем бекап и отредактируем его (рис. [-@fig:003]).

```
complete:
[root@server dmosharov.net ~]# cp /etc/kea/kea-dhcp4.conf /etc/kea/kea-dhcp4.conf_$(date +%Y%m%d%H%M%S)
[root@server dmosharov.net ~]# nano /etc/kea/kea-dhcp4.conf
```

Бекап конфига

Мы поменяем изначальные данные на свои - изменим доменное имя на собственное, а также поставим ip на ip нашей машины - 192.168.1.1 (рис. [-@fig:004]).

```
GNU nano 8.1 /etc/kea/dhcp4.conf Modified
// domain-name-servers y could do this:
// {
//   "name": "domain-name-servers",
//   "code": 6,
//   "csv-format": "true",
//   "space": "dhcp4",
//   "data": "192.0.2.1, 192.0.2.2"
// }
// but it's a lot of writing, so it's easier to do this instead:
{
  "name": "domain-name-servers",
  "data": "192.168.1.1"
},

// Typically people prefer to refer to options by their names, so they
// don't need to remember the code names. However, some people like
// to use numerical values. For example, option 'domain-name' uses
// option code 15, so you can reference to it either by
// "name": "domain-name" or "code": 15.
{
  "code": 15,
  "data": "dmosharov.net"
},
{
  "name": "domain-search",
  "data": "dmosharov.net"
},

// Domain search is also a popular option. It tells the client to
// attempt to resolve names within those specified domains. For
// example, name "foo" would be attempted to be resolved as
// foo.mydomain.example.com and if it fails, then as foo.example.com
{
  "name": "domain-search",
  "data": "mydomain.example.com, example.com"
},
```

Редактирование конфига

Спустимся ниже и настроим свою подсеть следующим образом (рис. [-@fig:005]).

```
GNU nano 8.1 /etc/kea/dhcp4.conf Modified
// structures.
'subnet4': [
{
// This defines the whole subnet. Kea will use this information to
// determine where the clients are connected. This is the whole
// subnet in your network.

// Subnet identifier should be unique for each subnet.
'id': 1,

// This is mandatory parameter for each subnet.
'subnet': '192.168.1.0/24',

// Pools define the actual part of your subnet that is governed
// by Kea. Technically this is optional parameter, but it's
// almost always needed for DHCP to do its job. If you omit it,
// clients won't be able to get addresses, unless there are
// host reservations defined for them.
'pools': [ { 'pool': '192.168.1.30 - 192.168.1.199' } ],

// This is one of the subnet selectors. Uncomment the 'interface
'option-data': [
{
// For each IPv4 subnet you most likely need to specify at
// least one router.
'name': 'routers',
'data': '192.168.1.1'
},
],
},
],
```

Настройка подсети

И установим интерфейс для dhcp как eth1 (рис. [-@fig:006]).

```
// DHCPv4 configuration starts here. This section will be read by DHCPv4 server
// and will be ignored by other components.
'dhcp4': {
// Add names of your network interfaces to listen on.
'interfaces-config': {
// See section 8.2.4 for more details. You probably want to add just
// interface name (e.g. "eth0") or specific IPv4 address on that
// interface name (e.g. "eth0/192.0.2.1").
'interfaces': ['eth1'],

// Kea DHCPv4 server by default listens using raw sockets. This ensures
// all packets, including those sent by directly connected clients
// that don't have IPv4 address yet, are received. However, if your
// traffic is always relayed, it is often better to use regular
// UDP sockets. If you want to do that, uncomment this line:
// "dhcp-socket-type": "udp"
},
},
```

Установка интерфейса

Загрузим конфиг и убедимся, что нигде нет критическиз ошибок (рис. [-@fig:007]).

```
2025-12-17 00:12:25.544 INFO [kea-dhcp4.dhcp4srv/32183.139784297804928] DHCP4SRV_CFOEMR_SOCKET_TYP
E_DEFAULT "dhcp-socket-type" not specified , using default socket type raw
2025-12-17 00:12:25.544 INFO [kea-dhcp4.dhcp4srv/32183.139784297804928] DHCP4SRV_LEASE_MGR_BACKEND
S_REGISTERED the following lease backend types are available: memfile
2025-12-17 00:12:25.544 INFO [kea-dhcp4.hosts/32183.139784297804928] HOSTS_BACKENDS_REGISTERED t
he following host backend types are available:
2025-12-17 00:12:25.544 INFO [kea-dhcp4.dhcp4srv/32183.139784297804928] DHCP4SRV_FORENSIC_BACKENDS
_REGISTERED the following forensic backend types are available:
2025-12-17 00:12:25.544 INFO [kea-dhcp4.database/32183.139784297804928] CONFIG_BACKENDS_REGISTER
ED the following config backend types are available:
^C
```

Загрузка конфига

Перезагрузим системные даемоны (рис. [-@fig:008]).

```
[root@server.dmosharov.net ~]# systemctl --system daemon-reload
[root@server.dmosharov.net ~]# systemctl enable kea-dhcp4.service
Created symlink '/etc/systemd/system/multi-user.target.wants/kea-dhcp4.service'
→ '/usr/lib/systemd/system/kea-dhcp4.service'.
```

Перезагрузка даемонов

И слегка отредактируем наш файл с прошлой лабораторной работы в папке fz,

добавив запись о `dhcr` (рис. [-@fig:009]).

```
GNU nano 8.1 /var/named/master/fz/dmshosharov.net
$TTL 1D
@ IN SOA @ server.dmoshsharov.net. (
    2025121701      ; serial
    1D      ; refresh
    1H      ; retry
    1W      ; expire
    3H )      ; minimum

NS      @
A        192.168.1.1
$ORIGIN dmshosharov.net.
server A 192.168.1.1
ns A 192.168.1.1
dhcp A 192.168.1.1
```

Редактирование fz

То же самое сделаем с rz (рис. [-@fig:010]).

```
GNU nano 8.1 /var/named/master/rz/192.168.1
$TTL 1D
@       IN SOA  @ server.dmosharov.net. (
                                2025121701
                                1D      : refresh
                                1H      : retry
                                1W      : expire
                                3H      : minimum

NS      @
A        192.168.1.1
PTR      server.dmosharov.net.

$ORIGIN 1.168.192.in-addr.arpa.
1 PTR server.dmosharov.net.
1 PTR ns.dmosharov.net.
1 PTR dhcp.dmosharov.net
```

rz

Перезагрузим сервер ДНС и убедимся, что мы можем пингануть dnser сервер (рис. [-@fig:011]).

```
[root@server.dmosharov.net ~]# systemctl restart name
[root@server.dmosharov.net ~]# ping dhcp.dmosharov.net
PING dhcp.dmosharov.net (192.168.1.1) 56(84) bytes of data:
64 bytes from dhcp.dmosharov.net: 1.168.192.in-addr.arpa (192.168.1.1): icmp_seq=1 ttl=64 time=0.842 ms
64 bytes from dhcp.dmosharov.net: 1.168.192.in-addr.arpa (192.168.1.1): icmp_seq=2 ttl=64 time=0.862 ms
64 bytes from dhcp.dmosharov.net: 1.168.192.in-addr.arpa (192.168.1.1): icmp_seq=3 ttl=64 time=0.859 ms
64 bytes from dhcp.dmosharov.net: 1.168.192.in-addr.arpa (192.168.1.1): icmp_seq=4 ttl=64 time=0.883 ms
64 bytes from dhcp.dmosharov.net: 1.168.192.in-addr.arpa (192.168.1.1): icmp_seq=5 ttl=64 time=0.858 ms
```

ПИНГ dncp

Теперь настроим firewall и обновим метки selinux (рис. [-@fig:012]).

[illegible]

firewall и selinux

Убедимся по логам, что сервер ДНС работает и не выдаёт ошибок (рис. [-@fig:013]).

[illegible]

Логи сервера

Теперь запускаем dhcp сервер (рис. [-@fig:014]).

```
[root@server.dmmosharov.net ~]# systemctl start kea-dhcp4.service
[root@server.dmmosharov.net ~]#
```

Запуск dhsr

Посмотрим на лог и убедимся, что запуск был успешен (рис. [-@fig:015]).

[illegible]

Сверка по логу

Далее убедимся в том, что в нашей папке клиента в `vagrant` представлен скрипт следующего содержания для настройки сети, берущей свой `ip` по `dhcp` (рис. [fig:016]).

```
$ 01-routing.sh X
C> work_asp > dmmosharov > vagrant > provision > client > $ 01-routing.sh
1 #!/bin/bash
2
3 echo "Provisioning script $0"
4
5 nmcli connection modify "System eth1" ipv4.gateway "192.168.1.1"
6 nmcli connection up "System eth1"
7
8 nmcli connection modify eth0 ipv4.never-default true
9 nmcli connection modify eth0 ipv6.never-default true
10
11 nmcli connection down eth0
12 nmcli connection up eth0
13
14 # systemctl restart NetworkManager
15
```

Скрипт для клиента

В Vagrantfile мы убедимся, что этот скрипт прописан для запуска (рис. [-@fig:017]).

```

110 client.vm.provision "client dummy",
111     type: "shell",
112     preserve_order: true,
113     path: "provision/client/01-dummy.sh"
114
115 client.vm.provision "client routing",
116     type: "shell",
117     preserve_order: true,
118     run: "always",
119     path: "provision/client/01-routing.sh"

```

Vagrantfile

Когда приготовления завершены, мы можем запустить клиент (рис. [-@fig:018]).

```
C:\work_asp\dimoharov\vagrant>vagrant up client --provision
Bringing machine 'client' up with 'virtualbox' provider...
==> client: Clearing any previously set forwarded ports...
==> client: Fixed port collision for 22 => 2222. Now on port 2200.
==> client: Clearing any previously set network interfaces...
==> client: Preparing network interfaces based on configuration...
client: Adapter 1: nat
client: Adapter 2: intnet
==> client: Forwarding ports...
client: 22 (guest) => 2200 (host) (adapter 1)
==> client: Running 'pre-boot' VM customizations...
==> client: Booting VM...
```

Запуск клиента

Зайдя в клиент, через `ifconfig` убедимся, что айпи был получен с сервера. Это так, айпи назначился как 192.168.1.30 (рис. [-@fig:019']).

```
eth1: flags=4163<UP, BROADCAST, RUNNING, MULTICAST> mtu 1500
    inet 192.168.1.30 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::527:9849:94c7:d79e prefixlen 64 scopeid 0x20<link>
    ether 08:00:27:9a:3e:01 txqueuelen 1000 (Ethernet)
    RX packets 328 bytes 42793 (41.7 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 889 bytes 72631 (70.9 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

ifconfig

Информация о назначении айпи также хранится в файле `/var/lib/kea/kea-leases4.csv` на сервере (рис. [-@fig:020]).

```

GNU nano 8.1 /var/lib/kea/kea-leases4.csv
address,haaddr,client_id,valid_lifetime,expire,subnet_id,fqdn_fwd,fqdn_rev,hostname,state,user_context,pool_id
192.168.1.30,08:00:27:9a:3e:01,01:08:00:27:9a:3e:01,3600,1765938337,1,0,0,client,0,0

```

Таблица с назначениями

Теперь создадим ключ sha512 и убедимся в том, что он создался (рис. [-@fig:021]).

```
[root@server.dmmosharov.net ~]# mkdir -p /etc/named/keys
[root@server.dmmosharov.net ~]# tsig-keygen -a HMAC-SHA512 DHCP_UPDATER > /
etc/named/keys/dhcp_updater.key
[root@server.dmmosharov.net ~]# cat etc/named/keys/dhcp_updater.key
cat: etc/named/keys/dhcp_updater.key: No such file or directory
[root@server.dmmosharov.net ~]# cat /etc/named/keys/dhcp_updater.key
key "DHCP_UPDATER" {
  algorithm hmac-sha512;
  secret "xPISaBX6DeMhr3JRrdGArdhLQwYynXXvyV8pAud8svkz55ld+h5eNrZ0Zq
pmwZEvYV3shfty2rK6AuYN0DUoA==";
};
[root@server.dmmosharov.net ~]#
```

Ключ sha512

Этот ключ добавим в /etc/named.conf (рис. [-@fig:022]).



```
GNU nano 8.1 /etc/named.conf Modified
*/
recursion yes;

dnssec-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;
    };
};

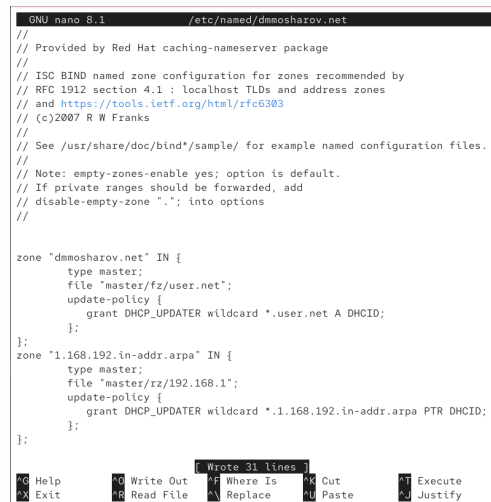
zone "." IN {
    type hint;
    file "named.ca";
};

include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";
include "/etc/named/dmmosharov.net";
include "/etc/named/keys/dhcp_updater.key";

[ Help Write Out Where Is Cut Execute
X Exit Read File Replace Paste Justify ]
```

Добавление ключа

Обновим файл /etc/named/dmmosharov.net, добавив туда dhcp (рис. [-@fig:023]).



```
GNU nano 8.1 /etc/named/dmmosharov.net
//
// 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 "dmmosharov.net" IN {
    type master;
    file "master/fz/user.net";
    update-policy {
        grant DHCP_UPDATER wildcard *.user.net A DHCID;
    };
};

zone "1.168.192.in-addr.arpa" IN {
    type master;
    file "master/rz/192.168.1";
    update-policy {
        grant DHCP_UPDATER wildcard *.1.168.192.in-addr.arpa PTR DHCID;
    };
};

[ Help Write Out Where Is Cut Execute
X Exit Read File Replace Paste Justify ]
```

Обновление файла

Проверим корректность конфига на синтаксис и перезапустим DNS службу, а также создадим файл с ключом (рис. [-@fig:024]).

```
[root@server.dmmosharov.net ~]# nano /etc/named/dmmosharov.net
[root@server.dmmosharov.net ~]# named-checkconf
[root@server.dmmosharov.net ~]# systemctl restart named
[root@server.dmmosharov.net ~]# touch /etc/kea/tsig-keys.json
[root@server.dmmosharov.net ~]#
```

Применение изменений

В созданный файл вставим ключ, который мы сгенерировали ранее (рис. [-@fig:025]).

```
root@server:~# sudo -i
GNU nano 8.1 /etc/kea/keys.json Modified
[
  "tsig-keys": [
    {
      "name": "DHCP_UPDATER",
      "algorithm": "hmac-sha512",
      "secret": "xP1SaBx6DeMhr3JRz6ArdhLcWYynXXvyY8pAud8svkz551d+h5eNrzQZqpmwZEvyV3shfty2zK6AuYNG"
    }
  ],
}
```

Порядок монтирования

Поменяем права и владельца созданного файла, предоставив его системному пользователю службы (рис. [-@fig:026]).

```
[root@server.dmmosharov.net ~]# chown kea:kea /etc/kea/keys.json
[root@server.dmmosharov.net ~]# chmod 640 /etc/kea/keys.json
```

Смена прав файла

Теперь заполним файл конфигурации ddns, который перепишем с нуля согласно данному шаблону, поменяв имя на свой домен (рис. [-@fig:027]).

```
GNU nano 8.1 /etc/kea/kea-dhcp-ddns.conf
[
  "DhcpDdns": {
    {
      "ip-address": "127.0.0.1",
      "port": 53001,
      "control-socket": {
        "socket-type": "unix",
        "socket-name": "/run/kea/kea-ddns-ctrl-socket"
      },
      <?include "/etc/kea/keys.json"?>
      "forward-ddns" : {
        "ddns-domains" : [
          {
            "name": "dmmosharov.net.",
            "key-name": "DHCP_UPDATER",
            "dns-servers": [
              { "ip-address": 192.168.1.1 }
            ]
          }
        ]
      },
      "reverse-ddns" : {
        "ddns-domains" : [
          {
            "name": "1.168.192.in-addr.arpa.",
            "key-name": "DHCP_UPDATER",
            "dns-servers": [
              { "ip-address": "192.168.1.1" }
            ]
          }
        ]
      }
    }
  ]
}
```

Изменение конфигурации

Предоставим этот файл во владение системному пользователю, а так же загрузим эту конфигурацию, и убедимся, что она загружена успешно. После этого перезапустим ddns службу (рис. [-@fig:028]).

```
ted: '/var/run/kea', supported path is '/run/kea'
Dec 17 20:22:33 server.dmmosharov.net systemd[1]: kea-dhcp-ddns.service: Main
process exited, code=exited, status=1/FAILURE
Dec 17 20:22:33 server.dmmosharov.net systemd[1]: kea-dhcp-ddns.service: Failed
with result 'exit-code'.
[root@server.dmmosharov.net ~]# sed -i 's|'/var/run/kea|'/run/kea|g' /etc/ke
a/kea-dhcp-ddns.conf
[root@server.dmmosharov.net ~]# grep socket-name /etc/kea/kea-dhcp-ddns.conf
socket-name: "/run/kea/kea-ddns-ctrl-socket"
[root@server.dmmosharov.net ~]# systemctl restart kea-dhcp-ddns
systemctl status kea-dhcp-ddns
● kea-dhcp-ddns.service - Kea DHCP-DDNS Server
   Loaded: loaded (/usr/lib/systemd/system/kea-dhcp-ddns.service; enabled;
   Active: active (running) since Wed 2025-12-17 20:25:02 UTC; 16ms ago
   Invocation: 8056c7f8d42e447988f9f909f74e3962
   Docs: man:kea-dhcp-ddns(8)
   Main PID: 35308 ((hcp-ddns))
   Tasks: 1 (Limit: 22834)
   Memory: 1.7M (peak: 1.7M)
   CPU: 4ms
   CGroup: /system.slice/kea-dhcp-ddns.service
           └─35308 ((hcp-ddns))

Dec 17 20:25:02 server.dmmosharov.net systemd[1]: Started kea-dhcp-ddns.servi
lines 1-13/13 (END)
```

Перезапуск ddns

Теперь добавим информацию о ddns в наш файл с конфигурацией dhcp (рис. [-@fig:029]).

```
"renew-timer": 900,
"rebind-timer": 1800,
"valid-lifetime": 3600,
"dhcp-ddns": {
    "enable-updates": true
},
"ddns-qualifying-suffix": "dmmosharov.net",
"ddns-override-client-update": true,
"option-data": [
    {
        "name": "domain-name-servers",
        "data": "192.168.1.1"
    }
].
```

Добавление информации о ddns

Вновь загрузим конфигурацию и перезапустим службу dhcp (рис. [-@fig:030]).

```
ns lookup is always performed first.
2025-12-17 20:29:19.996 INFO [kea-dhcp4.dhcp4srv/35874.139723378295936] DHCPSE
V_CFMGR_NEW_SUBNET4 a new subnet has been added to configuration: 192.168.1.0
/24 with params: tl=900, t2=1800, valid-lifetime=3600
2025-12-17 20:29:19.996 INFO [kea-dhcp4.dhcp4srv/35874.139723378295936] DHCPSE
V_CFMGR_SOCKET_TYPE_SELECT using socket type raw
2025-12-17 20:29:19.996 INFO [kea-dhcp4.dhcp4srv/35874.139723378295936] DHCPSE
V_CFMGR_ADD_IFACE listening on interface eth1
2025-12-17 20:29:19.996 INFO [kea-dhcp4.dhcp4srv/35874.139723378295936] DHCPSE
V_CFMGR_SOCKET_TYPE_DEFAULT "dhcp-socket-type" not specified , using default
socket type raw
2025-12-17 20:29:19.996 INFO [kea-dhcp4.dhcp4srv/35874.139723378295936] DHCPSE
V_LEASE_MGR_BACKENDS_REGISTERED the following lease backend types are availabl
e: memfile
2025-12-17 20:29:19.996 INFO [kea-dhcp4.hosts/35874.139723378295936] HOSTS_BA
CKENDS_REGISTERED the following host backend types are available:
2025-12-17 20:29:19.996 INFO [kea-dhcp4.dhcp4srv/35874.139723378295936] DHCPSE
V_FORENSIC_BACKENDS_REGISTERED the following forensic backend types are availa
ble:
2025-12-17 20:29:19.996 INFO [kea-dhcp4.database/35874.139723378295936] CONFID
G_BACKENDS_REGISTERED the following config backend types are available:
[root@server.dmmosharov.net ~]# systemctl restart kea-dhcp4.service
[root@server.dmmosharov.net ~]# systemctl status kea-dhcp4.service
● kea-dhcp4.service - Kea DHCPv4 Server
   Loaded: loaded (/usr/lib/systemd/system/kea-dhcp4.service; enabled; presen
   Active: active (running) since Wed 2025-12-17 20:29:31 UTC; 8s ago
   Invocation: efl7d150e87f47408a7a7ad1327e0d06
   Docs: man:kea-dhcp4(8)
   Main PID: 35912 (kea-dhcp4)
   Status: "Dispatching packets..."
   Tasks: 9 (limit: 22834)
   Memory: 2.5M (peak: 6.1M)
   CPU: 28ms
   CGroup: /system.slice/kea-dhcp4.service
           └─35912 /usr/sbin/kea-dhcp4 -c /etc/kea/kea-dhcp4.conf
```

Перезапуск службы с применением изменений

Теперь на клиенте перезапустим интернет, чтобы обновить данные (рис. [-@fig:031]).

```
[dmmosharov@client.dmmosharov.net ~]$ nmcli connection down eth1
Connection 'eth1' successfully deactivated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/4)
[dmmosharov@client.dmmosharov.net ~]$ nmcli connection up eth1
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/6)
[dmmosharov@client.dmmosharov.net ~]$
```

Обновление данных

Теперь через dig получим информацию о нашем сервере (рис. [-@fig:032]).

```
root@server:/usr/local/sbin# dig @192.168.1.1 client.dmmosharov.net
; <<>> DiG 9.18.33 <<>> @192.168.1.1 client.dmmosharov.net
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 59287
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags::; udp: 1232
; COOKIE: 6cdae30253f866d1010000006943133846cffe0da90db136 (good)
;; QUESTION SECTION:
;client.dmmosharov.net.          IN      A

;; ANSWER SECTION:
client.dmmosharov.net.  1200    IN      A      192.168.1.30

;; Query time: 1 msec
;; SERVER: 192.168.1.1#53(192.168.1.1) (UDP)
;; WHEN: Wed Dec 17 20:31:48 UTC 2025
;; MSG SIZE rcvd: 94

[dmmosharov@client.dmmosharov.net ~]$
```

dig

Теперь переместим данные созданных ранее конфигураций в вагрант, после чего создадим скрипт (рис. [-@fig:033]).

```
[root@server.dmmosharov.net ~]# cd /vagrant/provision/server
[root@server.dmmosharov.net server]# mkdir -p /vagrant/provision/server/dhcp/etc/kea
[root@server.dmmosharov.net server]# cp -R /etc/kea/* /vagrant/provision/server/dhcp/etc/kea/
[root@server.dmmosharov.net server]# cd /vagrant/provision/server/dns/
[root@server.dmmosharov.net dns]# cp -R /var/named/* /vagrant/provision/server/dns/var/named/
cp: overwrite '/vagrant/provision/server/dns/var/named/master/fz/dmmosharov.net'? y
cp: overwrite '/vagrant/provision/server/dns/var/named/master/rz/192.168.1'? y
[root@server.dmmosharov.net dns]# cp -R /etc/named/* /vagrant/provision/server/dns/etc/named/
cp: overwrite '/vagrant/provision/server/dns/etc/named/dmmosharov.net'? y
[root@server.dmmosharov.net dns]# cd /vagrant/provision/server
[root@server.dmmosharov.net server]# touch dhcp.sh
[root@server.dmmosharov.net server]# chmod +x dhcp.sh
[root@server.dmmosharov.net server]#
```

Перенос конфигурации

В скрипте напишем алгоритм настройки dhcp (рис. [-@fig:034]).

```
GNU nano 8.1 dhcp.sh
#!/bin/bash
echo "Provisioning script $0"
echo "Install needed packages"
dnf -y install kea
echo "Copy configuration files"
cp -R /vagrant/provision/server/dhcp/etc/kea/* /etc/kea/
echo "Fix permissions"
chown -R kea:kea /etc/kea
chmod 640 /etc/kea/tsig-keys.json
restorecon -vR /etc
restorecon -vR /var/lib/kea
echo "Configure firewall"
firewall-cmd --add-service dhcp
firewall-cmd --add-service dhcp --permanent
echo "Start dhcpd service"
systemctl --system daemon-reload
systemctl enable --now kea-dhcp4.service
systemctl enable --now kea-dhcp-ddns.service
```

Скрипт vagrant

И добавим запуск скрипта в Vagrantfile (рис. [-@fig:035]).

```
81
82     server.vm.provision "server dns",
83         type: "shell",
84         preserve_order: true,
85         path: "provision/server/dns.sh"
86
87     server.vm.provision "server dhcp",
88         type: "shell",
89         preserve_order: true,
90         path: "provision/server/dhcp.sh"
91 end
92
93
```

Vagrantfile

Выводы

в результате выполнения работы были получены навыки настройки dhcp