

Отчет лабораторной работы 3

Администрирование сетевых
подсистем

Тема: Настройка ДНСП-сервера

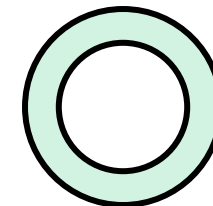
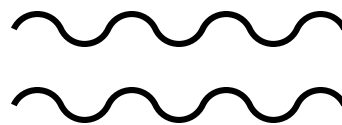
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Приобретение практических навыков
по установке и конфигурированию
DHCP сервера.

Установка DHCP-сервера



```
root@localhost:~  
containers-common-extra      x86_64 2:1-117.el9_6      appstream 9.1 k  
gstreamer1-plugins-bad-free-libs x86_64 1.22.12-4.el9_6      appstream 758 k  
kernel-core                  x86_64 5.14.0-570.58.1.el9_6  baseos    18 M  
kernel-modules               x86_64 5.14.0-570.58.1.el9_6  baseos    39 M  
kernel-modules-core          x86_64 5.14.0-570.58.1.el9_6  baseos    31 M  
keyutils                     x86_64 1.6.3-1.el9             baseos    72 k  
ledmon-libs                  x86_64 1.1.0-2.el9_6.1        baseos    40 k  
libadwaita                   x86_64 1.4.2-2.el9             appstream 555 k  
libdecor                     x86_64 0.1.1-1.el9             appstream 42 k  
libva                        x86_64 2.22.0-1.el9            appstream 113 k  
passt                         x86_64 0^20250217.gale48a0-13.el9_6 appstream 258 k  
passt-selinux                 noarch 0^20250217.gale48a0-13.el9_6 appstream 27 k  
python3-inotify               noarch 0.9.6-25.el9            baseos    52 k  
  
Transaction Summary  
=====  
Install 14 Packages  
Upgrade 586 Packages  
  
Total download size: 1.4 G  
Is this ok [y/N]:
```

```
Running scriptlet: kea-2.6.4-1.el9.x86_64  
Verifying      : kea-2.6.4-1.el9.x86_64  
Verifying      : kea-libs-2.6.4-1.el9.x86_64  
Verifying      : log4cplus-2.0.5-15.el9.x86_64  
Verifying      : mariadb-connector-c-3.2.6-1.el9_0.x86_64  
Verifying      : postgresql-private-libs-13.22-1.el9_6.x86_64  
Verifying      : mariadb-connector-c-config-3.2.6-1.el9_0.noarch  
  
Installed:  
kea-2.6.4-1.el9.x86_64  
kea-libs-2.6.4-1.el9.x86_64  
log4cplus-2.0.5-15.el9.x86_64  
mariadb-connector-c-3.2.6-1.el9_0.x86_64  
mariadb-connector-c-config-3.2.6-1.el9_0.noarch  
postgresql-private-libs-13.22-1.el9_6.x86_64  
  
Complete!
```

Конфигурирование DHCP-сервера

```
[root@localhost.user.net ~]# kea-dhcp4 -c /etc/kea/kea-dhcp4.conf
2025-11-13 11:55:12.005 INFO [kea-dhcp4.hosts/3233.140516217915520] HOSTS_BACKENDS_REGISTERED the following host backend types are available: mysql postgresql
2025-11-13 11:55:12.005 WARN [kea-dhcp4.dhcp4/3233.140516217915520] DHCP4_RESERVED_QUEUE_CONTROL disabling dhcp queue control when multi-threading is enabled.
2025-11-13 11:55:12.005 WARN [kea-dhcp4.dhcp4/3233.140516217915520] DHCP4_RESERVATIONS_LOOKUP_FIRST_ENABLED Multi-threading is enabled and host reservations lookup is always performed first.
2025-11-13 11:55:12.005 INFO [kea-dhcp4.dhcp4/3233.140516217915520] DHCP4_FGMGR_NEW_SUBNET4 a new subnet has been added to configuration: 192.168.1.0/24 with params: valid-lifetime=4000
2025-11-13 11:55:12.005 INFO [kea-dhcp4.dhcp4/3233.140516217915520] DHCP4_FGMGR_SOCKET_TYPE_SELECT using socket type raw
2025-11-13 11:55:12.005 INFO [kea-dhcp4.dhcp4/3233.140516217915520] DHCP4_FGMGR_ADD_IFACE listening on interface eth1
2025-11-13 11:55:12.005 INFO [kea-dhcp4.dhcp4/3233.140516217915520] DHCP4_FGMGR_SOCKET_TYPE_DEFAULT "dhcp-socket-type" not specified, using default socket type raw
[root@localhost.user.net ~]#
```

```
[root@localhost.user.net ~]# systemctl --system daemon-reload
[root@localhost.user.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.
[root@localhost.user.net ~]#
```

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



```
GNU nano 5.6.1 /etc/kea/kea-dhcp4.conf
},
{
  "name": "domain-name-servers",
  "data": "192.168.1.1"
}
],

"subnet4": [
  {
    "id": 1,
    /* specify subnet that DHCP is used */
    "subnet": "192.168.1.0/24",
    /* specify the range of IP addresses to be leased */
    "pools": [ { "pool": "192.168.1.30 - 192.168.1.199" } ],
    "option-data": [
      {
        /* specify your gateway */
        "name": "routers",
        "data": "192.168.1.1"
      }
    ]
  }
]
}
}

File Name to Write: /etc/kea/kea-dhcp4.conf
```

```
root@localhost:~
GNU nano 5.6.1 /var/named/master/fz/astakhovamd.net
$TTL 1D
@ IN SOA @ server.astakhovamd.net. (
    2024072700 ; serial
    1D ; refresh
    1H ; retry
    1W ; expire
    3H ) ; minimum
NS @
A 192.168.1.1
$ORIGIN astakhovamd.net.
server A 192.168.1.1
ns A 192.168.1.1
dhcp A 192.168.1.1
```

Анализ работы DHCP-сервера

```
#!/bin/bash
```

```
echo "Provisioning script $0"
```

```
nmcli connection modify "eth1" ipv4.gateway "192.168.1.1"  
nmcli connection up "eth1"
```

```
nmcli connection modify eth0 ipv4.never-default true  
nmcli connection modify eth0 ipv6.never-default true
```

```
nmcli connection down eth0  
nmcli connection up eth0
```

```
# systemctl restart NetworkManager
```

```
preserve_order: true,  
path: "provision/client/01-dummy.sh"
```

```
client.vm.provision "client routing",  
  type: "shell",  
  preserve_order: true,  
  run: "always",  
  path: "provision/client/01-routing.sh"
```

```
end  
end
```

```
[astakhovamd@localhost.user.net ~]$ ifconfig  
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500  
    inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255  
    inet6 fe80::a00:27ff:fe69:a8d prefixlen 64 scopeid 0x20<link>  
    inet6 fd17:625c:f037:2:a00:27ff:fe69:a8d prefixlen 64 scopeid 0x0<global>  
    ether 08:00:27:69:0a:8d txqueuelen 1000 (Ethernet)  
    RX packets 1843 bytes 209223 (204.3 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 1702 bytes 231903 (226.4 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
root@localhost:/var/lib/kea x root@localhost:~ x  
{  
  "name": "domain-search",  
  "data": "astakhovamd.net"  
},  
{  
  "name": "domain-name", // Часто используется вместе с domain-search  
  "data": "astakhovamd.net"  
},  
{  
  "name": "domain-name-servers",  
  "data": "192.168.1.1"  
}  
],  
  
"subnet4": [  
  {  
    "id": 1,  
    /* specify subnet that DHCP is used */  
    "subnet": "192.168.1.0/24",  
    /* specify the range of IP addresses to be leased */  
    "pools": [ { "pool": "192.168.1.30 - 192.168.1.199" } ],  
    "option-data": [  
      {  
        /* specify your gateway */  
        "name": "routers",  
        "data": "192.168.1.1"  
      }  
    ]  
  }  
]  
]  
}  
[root@localhost.user.net ~]#
```

Настройка обновления DNS-зоны



```
{
  "Dhcp4": {
    "interfaces-config": {
      "interfaces": [ "eth1" ]
    },
    "lease-database": {
      "type": "memfile",
      "persist": true,
      "name": "/var/lib/kea/dhcp4.leases"
    },
    "valid-lifetime": 4000,

    "option-data": [
      {
        "name": "domain-search",
        "data": "astakhovamd.net"
      },
      {
        "name": "domain-name",
        "data": "astakhovamd.net"
      },
      {
        "name": "domain-name-servers",
        "data": "192.168.1.1"
      }
    ],

    "dhcp-ddns": {
      "enable-updates": true
    },
    "ddns-qualifying-suffix": "astakhovamd.net",
    "ddns-override-client-update": true,
  },
}
```

```
[root@localhost.user.net kea]# kea-dhcp4 -t /etc/kea/kea-dhcp4.conf
2025-11-13 14:55:19.371 INFO [kea-dhcp4.hosts/5791.140421168659776] HOSTS_BACKENDS_REGISTERED the following host backend types are available: mysql postgresql
2025-11-13 14:55:19.371 WARN [kea-dhcp4.dhcp4/5791.140421168659776] DHCP4_RESERVED_QUEUE_CONTROL disabling dhcp queue control when multi-threading is enabled.
2025-11-13 14:55:19.371 WARN [kea-dhcp4.dhcp4/5791.140421168659776] DHCP4_RESERVED_QUEUE_CONTROL Multi-threading is enabled and host reservations lookup is always performed first.
2025-11-13 14:55:19.371 INFO [kea-dhcp4.dhcp4/5791.140421168659776] DHCP4_RESERVED_QUEUE_CONTROL a new subnet has been added to configuration: 192.168.1.0/24 with params: valid-lifetime=4000
2025-11-13 14:55:19.371 INFO [kea-dhcp4.dhcp4/5791.140421168659776] DHCP4_RESERVED_QUEUE_CONTROL using socket type raw
2025-11-13 14:55:19.371 INFO [kea-dhcp4.dhcp4/5791.140421168659776] DHCP4_RESERVED_QUEUE_CONTROL listening on interface eth1
2025-11-13 14:55:19.371 INFO [kea-dhcp4.dhcp4/5791.140421168659776] DHCP4_RESERVED_QUEUE_CONTROL "dhcp-socket-type" not specified , using default socket type raw
[root@localhost.user.net kea]#
```

```
[root@localhost.user.net ~]# dig @192.168.1.1 client.astakhovamd.net

; <<>> DiG 9.16.23-RH <<>> @192.168.1.1 client.astakhovamd.net
; (1 server found)
;; global options: +cmd
;; connection timed out; no servers could be reached
```

Анализ работы DHCP-сервера после настройки обновления DNS-зоны

```
root@vagrant-ubuntu-trusty-64:~# su vagrant
vagrant@vagrant-ubuntu-trusty-64:/root$ dig @192.168.1.1 client.astakhovamd.net

; <>> DiG 9.10.3-P4-Ubuntu <>> @192.168.1.1 client.astakhovamd.net
; (1 server found)
;; global options: +cmd
;; connection timed out; no servers could be reached
vagrant@vagrant-ubuntu-trusty-64:/root$
vagrant@vagrant-ubuntu-trusty-64:/root$ _
```



Внесение изменений в настройки внутреннего окружения виртуальной машины



```
end
```

```
server.vm.provision "server dhcp",  
    type: "shell",  
    preserve_order: true,  
    path: "provision/server/dhcp.sh"
```

```
end
```

```
## Client configuration
```

```
#!/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
```