

# Отчёт по лабораторной работе №12

Настройки сети в Linux

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## Цель работы

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Получить навыки настройки сетевых параметров и управления сетевыми соединениями в Linux.

## Выполнение лабораторной работы

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# Получение полномочий администратора

```
dsyakovleva@dsyakovleva:~$ su -
Password:
Last login: Wed Nov 19 22:19:59 MSK 2025 on pts/0
root@dsyakovleva:~# ip -s link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen
1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    RX:  bytes packets errors dropped missed mcast
         2550      24      0      0      0      0
    TX:  bytes packets errors dropped carrier collsns
         2550      24      0      0      0      0
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP mode DEFAULT group def
ault qlen 1000
    link/ether 08:00:27:3a:6e:6b brd ff:ff:ff:ff:ff:ff
    RX:  bytes packets errors dropped missed mcast
        2097088    2553      0      0      0    15
    TX:  bytes packets errors dropped carrier collsns
        829896     1512      0      0      0      0
    altnam enx0800273a6e6b
root@dsyakovleva:~# ip route show
default via 10.0.2.2 dev enp0s3 proto dhcp src 10.0.2.15 metric 100
10.0.2.0/24 dev enp0s3 proto kernel scope link src 10.0.2.15 metric 100
root@dsyakovleva:~# SS
```

Рис. 1: Переход к root

## Просмотр состояния интерфейсов

```
root@dsyakovleva:~# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:3a:6e:6b brd ff:ff:ff:ff:ff:ff
    altname enx0800273a6e6b
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 81486sec preferred_lft 81486sec
    inet6 fd17:625c:f037:2:a00:27ff:fe3a:6e6b/64 scope global dynamic noprefixroute
        valid_lft 86324sec preferred_lft 14324sec
    inet6 fe80::a00:27ff:fe3a:6e6b/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root@dsyakovleva:~# ping -c 4 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data.
64 bytes from 8.8.8.8: icmp_seq=1 ttl=255 time=18.3 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=255 time=19.6 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=255 time=18.4 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=255 time=17.7 ms

--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3010ms
rtt min/avg/max/mdev = 17.668/18.497/19.606/0.700 ms
root@dsyakovleva:~#
```

Рис. 2: Информация ip -s link

```
root@dsyakovleva:~# ip addr add 10.0.0.10/24 dev enp0s3
root@dsyakovleva:~# ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:3a:6e:6b brd ff:ff:ff:ff:ff:ff
    altname enx0800273a6e6b
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 81359sec preferred_lft 81359sec
    inet 10.0.0.10/24 scope global enp0s3
        valid_lft forever preferred_lft forever
    inet6 fd17:625c:f037:2:a00:27ff:fe3a:6e6b/64 scope global dynamic noprefixroute
        valid_lft 86197sec preferred_lft 14197sec
    inet6 fe80::a00:27ff:fe3a:6e6b/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
```

Рис. 3: Маршруты

## IP-адреса интерфейсов

```
root@dsyakovleva:~# ifconfig
enp0s3: 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:fe3a:6e6b prefixlen 64 scopeid 0x20<link>
    inet6 fd17:625c:f037:2:a00:27ff:fe3a:6e6b prefixlen 64 scopeid 0x0<global>
    ether 08:00:27:3a:6e:6b txqueuelen 1000 (Ethernet)
    RX packets 2559 bytes 2097654 (2.0 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 1525 bytes 831390 (811.9 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 24 bytes 2550 (2.4 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 24 bytes 2550 (2.4 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

root@dsyakovleva:~# ss -tul
```

Netid	State	Recv-Q	Send-Q	Local Address:Port	Peer Address:Port
udp	UNCONN	0	0	127.0.0.1:323	0.0.0.0:*
udp	UNCONN	0	0	0.0.0.0:mdns	0.0.0.0:*
udp	UNCONN	0	0	:::1:323	::::*
udp	UNCONN	0	0	:::mdns	:::*
tcp	LISTEN	0	4096	127.0.0.1:ipp	0.0.0.0:*
tcp	LISTEN	0	128	0.0.0.0:ssh	0.0.0.0:*
tcp	LISTEN	0	4096	:::1:ipp	:::*
tcp	LISTEN	0	4096	*:websm	*:*
tcp	LISTEN	0	511	*:http	*:*
tcp	LISTEN	0	128	:::ssh	:::*

```
root@dsyakovleva:~#
```



```
root@dsyakovleva:~# nmcli connection show
NAME      UUID                                  TYPE      DEVICE
enp0s3    7bf0d86a-f11b-3c65-8d78-7acdb4d025db ethernet  enp0s3
lo        223fb114-5777-457a-a27d-06224e62d9ff loopback   lo
root@dsyakovleva:~# nmcli connection add con-name "dhcp" type ethernet ifname
Error: value for 'ifname' is missing.
root@dsyakovleva:~# nmcli connection add con-name "dhcp" type ethernet ifname enp0s3
Connection 'dhcp' (2a046eea-9db1-4aca-a65c-8b06ec552c8a) successfully added.
root@dsyakovleva:~# nmcli connection add con-name "static" ifname enp0s3
Error: 'type' argument is required.
root@dsyakovleva:~# autoconnect no type ethernet ip4 10.0.0.10/24 gw4 10.0.0.1
bash: autoconnect: command not found...
root@dsyakovleva:~# nmcli connection add con-name "static" ifname enp0s3 autoconnect no type ethernet ip4 10.0.0.10/24 gw4 10.0.0.1
Connection 'static' (32f546db-6558-418d-8d22-d776a679a429) successfully added.
root@dsyakovleva:~#
```

Рис. 5: Список соединений

## Создание профиля dhcp

```
root@dsyakovleva:~# nmcli connection show
NAME      UUID                                  TYPE      DEVICE
enp0s3    7bf0d86a-f11b-3c65-8d78-7acdb4d025db ethernet  enp0s3
lo        223fb114-5777-457a-a27d-06224e62d9ff loopback  lo
dhcp      2a046eea-9db1-4aca-a65c-8b06ec552c8a ethernet  --
static    32f546db-6558-418d-8d22-d776a679a429 ethernet  --
root@dsyakovleva:~# nmcli connection up "static"
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/3)
root@dsyakovleva:~# nmcli connection show
NAME      UUID                                  TYPE      DEVICE
static    32f546db-6558-418d-8d22-d776a679a429 ethernet  enp0s3
lo        223fb114-5777-457a-a27d-06224e62d9ff loopback  lo
dhcp      2a046eea-9db1-4aca-a65c-8b06ec552c8a ethernet  --
enp0s3    7bf0d86a-f11b-3c65-8d78-7acdb4d025db ethernet  --
root@dsyakovleva:~# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:3a:6e:6b brd ff:ff:ff:ff:ff:ff
    altname enx0800273a6e6b
    inet 10.0.0.10/24 brd 10.0.0.255 scope global noprefixroute enp0s3
        valid_lft forever preferred_lft forever
    inet6 fd17:625c:f037:2:5723:9bb7:50c1:a5fd/64 scope global dynamic noprefixroute
        valid_lft 86372sec preferred_lft 14372sec
    inet6 fe80::d296:f973:4dd6:8d3b/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root@dsyakovleva:~#
```

## Создание профиля static

```
root@dsyakovleva:~# nmcli connection up "dhcp"
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/4)
root@dsyakovleva:~# nmcli connection show
NAME      UUID                                  TYPE      DEVICE
dhcp      2a045eea-9db1-4aca-a65c-8b06ec552c8a ethernet  enp0s3
lo        223fb114-5777-457a-a27d-06224e62d9ff loopback   lo
enp0s3    7bf0d86a-f11b-3c65-8d78-7acdb4d025db ethernet   --
static    32f546db-6558-418d-8d22-d776a679a429 ethernet   --
root@dsyakovleva:~# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:3a:6e:6b brd ff:ff:ff:ff:ff:ff
    altname enx0800273a6e6b
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 86389sec preferred_lft 86389sec
    inet6 fd17:625c:f037:2:4506:ed21:717d:c25c/64 scope global dynamic noprefixroute
        valid_lft 86391sec preferred_lft 14391sec
    inet6 fe30::98bc:11b7:bc65:7445/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root@dsyakovleva:~#
```

Рис. 7: Создание static

```
root@dsyakovleva:~# nmcli connection modify "static" connection.autoconnect no
root@dsyakovleva:~# nmcli connection modify "static" ipv4.dns 10.0.0.10
root@dsyakovleva:~# nmcli connection modify "static" +ipv4.dns 8.8.8.8
root@dsyakovleva:~# nmcli connection modify "static" +ipv4.addresses 10.0.0.20/24
root@dsyakovleva:~# nmcli connection modify "static" ipv4.addresses 10.0.0.20/24
root@dsyakovleva:~# nmcli connection modify "static" +ipv4.addresses 10.20.30.40/16
root@dsyakovleva:~# nmcli connection up "static"
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/5)
root@dsyakovleva:~#
```

Рис. 8: Изменение параметров

## Дополнительные DNS и IP-адреса

```
root@dsyakovleva:~# nmcli con show
NAME      UUID                                  TYPE      DEVICE
static    32f546db-6558-418d-8d22-d776a679a429 ethernet  enp0s3
lo        223fb114-5777-457a-a27d-06224e62d9ff loopback  lo
dhcp      2a046eea-9db1-4aca-a65c-8b06ec552c8a ethernet  --
enp0s3    7bf0d86a-f11b-3c65-8d78-7acdb4d025db ethernet  --
root@dsyakovleva:~# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host noprefixroute
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:3a:6e:6b brd ff:ff:ff:ff:ff:ff
    altname enx0800273a6e6b
    inet 10.0.0.20/24 brd 10.0.0.255 scope global noprefixroute enp0s3
        valid_lft forever preferred_lft forever
    inet 10.20.30.40/16 brd 10.20.255.255 scope global noprefixroute enp0s3
        valid_lft forever preferred_lft forever
    inet6 fd17:625c:f037:2:5723:9bb7:50c1:a5fd/64 scope global dynamic noprefixroute
        valid_lft 86273sec preferred_lft 14273sec
    inet6 fe80::d296:f973:4dd6:8d3b/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root@dsyakovleva:~#
```

Рис. 9: Модификация DNS и адресов

## Профиль static

Edit Connection

Profile name static

Device enp0s3 (08:00:27:3A:6E:6B)

= ETHERNET

<Show>

= 802.1X SECURITY

<Show>

= IPv4 CONFIGURATION <Manual>

<Hide>

Addresses 10.0.0.20/24 <Remove>

10.20.30.40/16 <Remove>

<Add...>

Gateway 10.0.0.1

DNS servers 10.0.0.10 <Remove>

8.8.8.8 <Remove>

<Add...>

Search domains <Add...>

Routing (No custom routes) <Edit...>

☐ Never use this network for default route

☐ Ignore automatically obtained routes

☐ Ignore automatically obtained DNS parameters

☐ Require IPv4 addressing for this connection

= IPv6 CONFIGURATION <Automatic>

<Show>

☐ Automatically connect

☒ Available to all users

<Cancel> <OK>

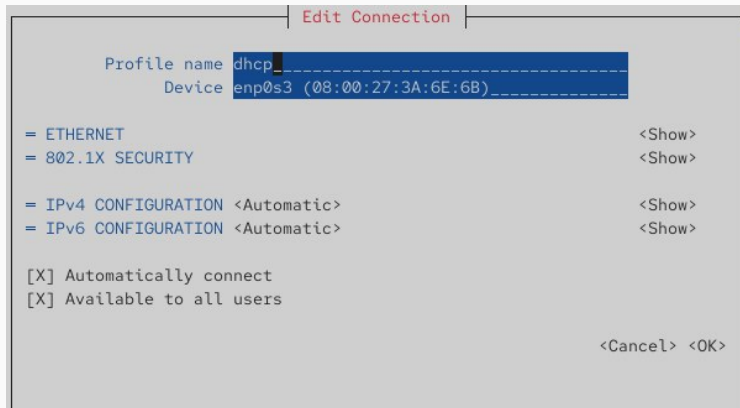


Рис. 11: nmtui dhcp

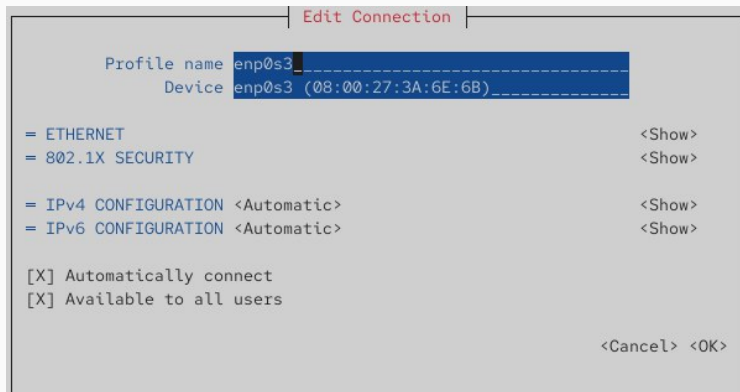


Рис. 12: nmtui enp0s3



Cancel

static

Apply

Details

Identity

IPv4

IPv6

Security

**IPv4 Method**

☐ Automatic (DHCP)

☒ Manual

☐ Shared to other computers

☐ Link-Local Only

☐ Disable

**Addresses**

Address	Netmask	Gateway	
10.0.0.20	255.255.255.0	10.0.0.1	✕
10.20.30.40	255.255.0.0		✕
			✕

**DNS**

Automatic ☒

10.0.0.10, 8.8.8.8

Separate IP addresses with commas

**Routes**

Automatic ☒

Address	Netmask	Gateway	Metric	
				✕

Cancel

dhcp

Apply

Details

Identity

IPv4

IPv6

Security

**IPv4 Method**

☒ Automatic (DHCP)

☐ Link-Local Only

☐ Manual

☐ Disable

☐ Shared to other computers

**DNS**

Automatic ☒

**Routes**

Automatic ☒

Address

Netmask

Gateway

Metric

☐ Use this connection only for resources on its network

Рис. 14: GUI dhcp

Cancel

enp0s3

Apply

Details

Identity

IPv4

IPv6

Security

IPv4 Method

☒ Automatic (DHCP)
 ☐ Link-Local Only
 ☐ Manual
 ☐ Disable
 ☐ Shared to other computers

DNS

Automatic

Separate IP addresses with commas

Routes

Automatic

Address

Netmask

Gateway

Metric

☐ Use this connection only for resources on its network

Рис. 15: GUI enp0s3

## Контрольные вопросы

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- Статус устройств: `nmcli device status`
- Служба сети: **NetworkManager**
- Имя устройства: `/etc/hostname`
- Изменение имени: `hostnamectl set-hostname`

- Локальное разрешение имён: `/etc/hosts`
- Маршруты: `ip route show`
- Статус NetworkManager: `systemctl status NetworkManager`
- Изменение IP:  
`nmcli connection modify <имя> ipv4.addresses <адрес>`

## Итоги работы

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Получены навыки:

- просмотра статуса интерфейсов и маршрутов
- добавления IP-адресов
- работы с профилями nmcli и nmtui
- изменения параметров сети

Практически освоены методы управления сетевыми настройками Linux.