

# Лабораторная работа №12

## Настройки сети в Linux

---

Турсунов Мухамметназар

2 ноября 2025

Российский университет дружбы народов, Москва, Россия

## Цель работы

---

Получить навыки настройки сетевых параметров системы Linux с использованием инструментов **ip**, **ifconfig**, **nmcli** и **nmtui**.

## Ход выполнения работы

---

# Проверка конфигурации сети

```
mtursunov@mtursunov:~$ su
Password:
root@mtursunov:/home/mtursunov# 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
         2538      24      0      0      0      0
    TX:  bytes packets errors dropped carrier collsns
         2538      24      0      0      0      0
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP mode DEFAULT group default
    qlen 1000
    link/ether 08:00:27:d3:be:a9 brd ff:ff:ff:ff:ff:ff
    RX:  bytes packets errors dropped missed mcast
         26725994  18715      0      0      0      2
    TX:  bytes packets errors dropped carrier collsns
         351173    5500      0      0      0      0
    altname enx080027d3bea9
root@mtursunov:/home/mtursunov# 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@mtursunov:/home/mtursunov#
```

Рис. 1: Информация об интерфейсах и статистика пакетов

```
root@mtursunov:/home/mtursunov#  
root@mtursunov:/home/mtursunov# 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=24.0 ms  
64 bytes from 8.8.8.8: icmp_seq=2 ttl=255 time=24.6 ms  
64 bytes from 8.8.8.8: icmp_seq=3 ttl=255 time=24.2 ms  
64 bytes from 8.8.8.8: icmp_seq=4 ttl=255 time=24.0 ms  
  
--- 8.8.8.8 ping statistics ---  
4 packets transmitted, 4 received, 0% packet loss, time 3004ms  
rtt min/avg/max/mdev = 23.966/24.191/24.589/0.250 ms  
root@mtursunov:/home/mtursunov#
```

Рис. 2: Проверка доступности узла 8.8.8.8

## Добавление IP-адреса

```
root@mtursunov:/home/mtursunov#  
root@mtursunov:/home/mtursunov# ip addr add 10.0.0.10/24 dev enp0s3  
root@mtursunov:/home/mtursunov# 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:d3:be:a9 brd ff:ff:ff:ff:ff:ff  
    altname enx080027d3bea9  
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3  
        valid_lft 85374sec preferred_lft 85374sec  
    inet 10.0.0.10/24 scope global enp0s3  
        valid_lft forever preferred_lft forever  
    inet6 fd17:625c:f037:2:a00:27ff:fed3:bea9/64 scope global dynamic noprefixroute  
        valid_lft 86386sec preferred_lft 14386sec  
    inet6 fe80::a00:27ff:fed3:bea9/64 scope link noprefixroute  
        valid_lft forever preferred_lft forever  
root@mtursunov:/home/mtursunov#
```

Рис. 3: Добавление дополнительного IP-адреса

```
root@mtuirsunov:/home/mtuirsunov#  
root@mtuirsunov:/home/mtuirsunov# 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:fed3:bea9 prefixlen 64 scopeid 0x20<link>  
    inet6 fd17:625c:f037:2:a00:27ff:fed3:bea9 prefixlen 64 scopeid 0x0<global>  
    ether 08:00:27:d3:be:a9 txqueuelen 1000 (Ethernet)  
    RX packets 105280 bytes 150315505 (143.3 MiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 27548 bytes 1681216 (1.6 MiB)  
    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 2538 (2.4 KiB)  
    RX errors 0 dropped 0 overruns 0 frame 0  
    TX packets 24 bytes 2538 (2.4 KiB)  
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  
  
root@mtuirsunov:/home/mtuirsunov#
```

Рис. 4: Информация об интерфейсах с помощью ifconfig



```
root@mtursunov:/home/mtursunov#  
root@mtursunov:/home/mtursunov# ss -tul
```

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

```
root@mtursunov:/home/mtursunov#
```

Рис. 5: Список прослушиваемых портов TCP и UDP

```
root@mtursunov:/home/mtursunov#  
root@mtursunov:/home/mtursunov# nmcli connection show  
NAME      UUID                                  TYPE      DEVICE  
enp0s3    ed938e94-1a45-3918-aa3a-fa38b9d11cb6  ethernet  enp0s3  
lo        9ea8bc98-d13e-4b12-b37e-ebf4a5cf45b0  loopback  lo  
root@mtursunov:/home/mtursunov# nmcli connection add con-name "dhcp" type ethernet ifname enp0s3  
Connection 'dhcp' (030bebf5-2ada-43aa-918e-ccca65e1d4ad) successfully added.  
root@mtursunov:/home/mtursunov# nmcli connection add con-name "static" ifname enp0s3 autoconnect no type  
ethernet ip4 10.0.0.10/24 gw4 10.0.0.1 ifname enp0s3  
Connection 'static' (1af2428c-9cd3-4362-b279-fc4bfe0bdff9) successfully added.  
root@mtursunov:/home/mtursunov# nmcli connection show  
NAME      UUID                                  TYPE      DEVICE  
enp0s3    ed938e94-1a45-3918-aa3a-fa38b9d11cb6  ethernet  enp0s3  
lo        9ea8bc98-d13e-4b12-b37e-ebf4a5cf45b0  loopback  lo  
dhcp      030bebf5-2ada-43aa-918e-ccca65e1d4ad  ethernet  --  
static    1af2428c-9cd3-4362-b279-fc4bfe0bdff9  ethernet  --  
root@mtursunov:/home/mtursunov#
```

Рис. 6: Список соединений NetworkManager

## Создание соединений dhcp и static

```
root@mtursunov:/home/mtursunov#  
root@mtursunov:/home/mtursunov# nmcli connection up static  
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/3  
)  
root@mtursunov:/home/mtursunov# nmcli connection show  
NAME      UUID                                  TYPE      DEVICE  
static    1af2428c-9cd3-4362-b279-fc4bfe0bdf99 ethernet  enp0s3  
lo        9ea8bc98-d13e-4b12-b37e-ebf4a5cf45b0 loopback   lo  
dhcp      030bebf5-2ada-43aa-918e-ccca65e1d4ad ethernet   --  
enp0s3    ed938e94-1a45-3918-aa3a-fa38b9d11cb6 ethernet   --  
root@mtursunov:/home/mtursunov# 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:d3:be:a9 brd ff:ff:ff:ff:ff:ff  
    altname enx080027d3bea9  
    inet 10.0.0.10/24 brd 10.0.0.255 scope global noprefixroute enp0s3  
        valid_lft forever preferred_lft forever  
    inet6 fd17:625c:f037:2:683a:9206:babb:77d4/64 scope global dynamic noprefixroute  
        valid_lft 86397sec preferred_lft 14397sec  
    inet6 fe80::7d7f:32ae:bed3:3685/64 scope link noprefixroute  
        valid_lft forever preferred_lft forever  
root@mtursunov:/home/mtursunov#
```

Рис. 7: Активация статического соединения

## Переключение между профилями

```
root@mtursunov:/home/mtursunov# nmcli connection up dhcp
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/4)
root@mtursunov:/home/mtursunov# nmcli connection show
NAME      UUID                                  TYPE      DEVICE
dhcp      030bebf5-2ada-43aa-918e-ccca65e1d4ad ethernet  enp0s3
lo        9ea8bc98-d13e-4b12-b37e-ebf4a5cf45b0 loopback  lo
enp0s3    ed938e94-1a45-3918-aa3a-fa38b9d11cb6 ethernet  --
static    1af2428c-9cd3-4362-b279-fc4bfe0bdf99 ethernet  --
root@mtursunov:/home/mtursunov# 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:d3:be:a9 brd ff:ff:ff:ff:ff:ff
    altname enx080027d3bea9
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic noprefixroute enp0s3
        valid_lft 86396sec preferred_lft 86396sec
    inet6 fd17:625c:f037:2:7f28:5bd1:e0de:dc23/64 scope global dynamic noprefixroute
        valid_lft 86397sec preferred_lft 14397sec
    inet6 fe80::dfb6:785f:86d:8e39/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root@mtursunov:/home/mtursunov#
```

Рис. 8: Переключение на соединение DHCP

# Изменение параметров static

```
root@mtursunov:/home/mtursunov# nmcli connection modify static connection.autoconnect no
root@mtursunov:/home/mtursunov# nmcli connection modify static ipv4.dns 10.0.0.10
root@mtursunov:/home/mtursunov# nmcli connection modify static +ipv4.dns 8.8.8.8
root@mtursunov:/home/mtursunov# nmcli connection modify static ipv4.addresses 10.0.0.20/24
root@mtursunov:/home/mtursunov# nmcli connection modify static +ipv4.addresses 10.20.30.40/16
root@mtursunov:/home/mtursunov# nmcli connection up static
Connection successfully activated (D-Bus active path: /org/freedesktop/NetworkManager/ActiveConnection/5)
)
root@mtursunov:/home/mtursunov# nmcli connection show
NAME      UUID                                  TYPE      DEVICE
static    1af2428c-9cd3-4362-b279-fc4bfe0bdf99 ethernet  enp0s3
lo        9ea8bc98-d13e-4b12-b37e-ebf4a5cf45b0 loopback  lo
dhcp      030bebf5-2ada-43aa-918e-ccca65e1d4ad ethernet  --
enp0s3    ed938e94-1a45-3918-aa3a-fa38b9d11cb6 ethernet  --
root@mtursunov:/home/mtursunov# 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:d3:be:a9 brd ff:ff:ff:ff:ff:ff
    altname enx080027d3bea9
    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:f037:2:683a:9206:babb:77d4/64 scope global dynamic noprefixroute
        valid_lft 86377sec preferred_lft 14377sec
    inet6 fe80::7d7f:32ae:bed3:3685/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
root@mtursunov:/home/mtursunov#
```

## Просмотр параметров через nmtui

↑

Edit Connection

Profile name static

Device enp0s3 (08:00:27:D3:BE:A9)

= 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

[X] Available to all users

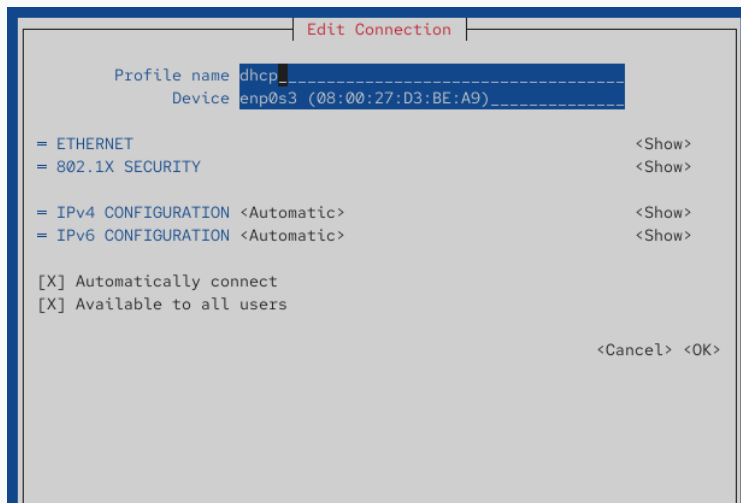


Рис. 11: Настройки соединения dhcp в nmtui

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



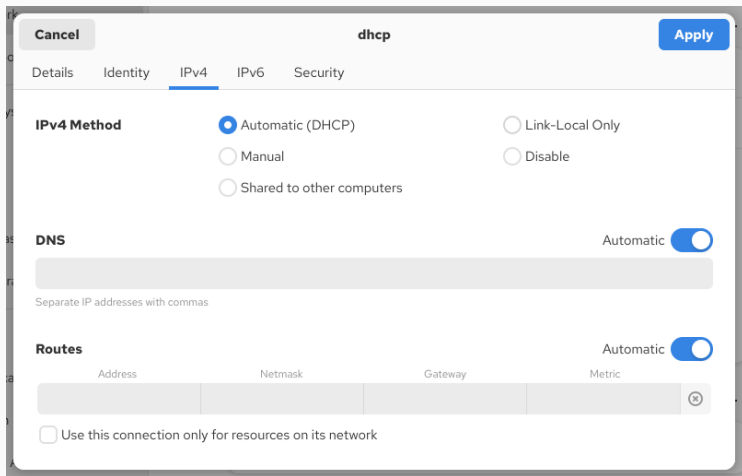


Рис. 13: Параметры соединения dhcp в графическом интерфейсе

## Итоги работы

---

В результате лабораторной работы были изучены методы конфигурирования сетевых интерфейсов в Linux.

Освоены утилиты **ip**, **ifconfig**, **ping**, **ss**, а также инструменты **nmcli** и **nmtui**.

Были выполнены операции добавления IP-адресов, настройки шлюза, DNS-серверов и маршрутов.

Все поставленные задачи выполнены успешно.