Введение в UNIX-системы

Домашняя работа

Урок 5. Сетевые возможности Linux

1. **Произвести ручную настройку сети в Ubuntu, на каждом шаге сделать скриншоты.**

```
mv 00-installer-config.yaml 00-installer-config.yaml.old
cat >/etc/netplan/00-installer-config.yaml << _EOF_
network:
  version: 2
  renderer: networkd
  ethernets:
    ens18:
      dhcp4: no
      addresses: [192.168.0.68/24]
      gateway4: 192.168.0.1
      nameservers:
        addresses:
          - 8.8.8.8
          - 8.8.4.4
_EOF_

netplan --debug generate
netplan --debug apply && reboot now
```

Импортируем конфигурацию:

Проверяем на ошибки:

```
root@gb-ubuntu-srv [192.168.0.243]:/etc/netplan#netplan --debug generate
DEBUG:command generate: running ['/lib/netplan/generate']
** (generate:1198): DEBUG: 12:14:22.717: Processing input file /etc/netplan/00-installer-config.yaml..
** (generate:1198): DEBUG: 12:14:22.717: starting new processing pass
** (generate:1198): DEBUG: 12:14:22.718: We have some netdefs, pass them through a final round of validation
** (generate:1198): DEBUG: 12:14:22.718: ens18: setting default backend to 1
** (generate:1198): DEBUG: 12:14:22.718: Configuration is valid
** (generate:1198): DEBUG: 12:14:22.718: Generating output files..
** (generate:1198): DEBUG: 12:14:22.718: openvswitch: definition ens18 is not for us (backend 1)
** (generate:1198): DEBUG: 12:14:22.718: NetworkManager: definition ens18 is not for us (backend 1)
(generate:1198): GLib-DEBUG: 12:14:22.719: posix_spawn avoided (fd close requested)
(generate:1198): GLib-DEBUG: 12:14:22.725: posix_spawn avoided (fd close requested)
root@gb-ubuntu-srv [192.168.0.243]:/etc/netplan#
```

Применяем:

```
root@gb-ubuntu-srv [192.168.0.243]:/etc/netplan#netplan --debug apply
** (generate:1213): DEBUG: 12:17:00.468: Processing input file /etc/netplan/00-installer-config.yaml..
** (generate:1213): DEBUG: 12:17:00.468: starting new processing pass
** (generate:1213): DEBUG: 12:17:00.469: We have some netdefs, pass them through a final round of validation
** (generate:1213): DEBUG: 12:17:00.469: ens18: setting default backend to 1
** (generate:1213): DEBUG: 12:17:00.469: Configuration is valid
** (generate:1213): DEBUG: 12:17:00.469: Generating output files..
** (generate:1213): DEBUG: 12:17:00.470: openvswitch: definition ens18 is not for us (backend 1)
** (generate:1213): DEBUG: 12:17:00.470: NetworkManager: definition ens18 is not for us (backend 1)
(generate:1213): GLib-DEBUG: 12:17:00.470: posix_spawn avoided (fd close requested)
(generate:1213): GLib-DEBUG: 12:17:00.475: posix_spawn avoided (fd close requested)
DEBUG:netplan generated networkd configuration changed, restarting networkd
DEBUG:ens18 not found in {}
DEBUG:Merged config:
network:
  ethernets:
    ens18:
      addresses:
      - 192.168.0.68/24
      dhcp4: false
      gateway4: 192.168.0.1
      nameservers:
        addresses:
        - 8.8.8.8
        - 8.8.4.4
  renderer: networkd
  version: 2
```

```
Last login: Mon Feb 28 12:12:05 2022 from 192.168.0.202
sa@gb-ubuntu-srv [192.168.0.68]:~$ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 86:9a:4e:46:b6:75 brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 192.168.0.68/24 brd 192.168.0.255 scope global ens18
       valid_lft forever preferred_lft forever
    inet6 fe80::849a:4eff:fe46:b675/64 scope link
       valid_lft forever preferred_lft forever
sa@gb-ubuntu-srv [192.168.0.68]:~$
```

2. **Переключить настройку сети на автоматическую через DHCP, проверить получение адреса.**

```
cat >/etc/netplan/00-installer-config.yaml << _EOF_
network:
  version: 2
  renderer: networkd
  ethernets:
    ens18:
      dhcp4: yes
      nameservers:
        addresses:
          - 77.88.8.88
          - 77.88.8.2
  _EOF_
```

```
netplan --debug generate
netplan --debug apply && reboot now
```

```
root@gb-ubuntu-srv [192.168.0.68]:/home/sa#cat >/etc/netplan/00-installer-config.yaml << _EOF_
> network:
version:>   version: 2
>   renderer: networkd
>   ethernets:
>     ens18:
>       dhcp4: yes
>       nameservers:
>         addresses:
>           - 77.88.8.88
>           - 77.88.8.2
> _EOF_
root@gb-ubuntu-srv [192.168.0.68]:/home/sa#netplan --debug generate
DEBUG:command generate: running ['/lib/netplan/generate']
** (generate:1483): DEBUG: 12:23:09.956: Processing input file /etc/netplan/00-installer-config.yaml..
** (generate:1483): DEBUG: 12:23:09.956: starting new processing pass
** (generate:1483): DEBUG: 12:23:09.956: We have some netdefs, pass them through a final round of validation
** (generate:1483): DEBUG: 12:23:09.956: ens18: setting default backend to 1
** (generate:1483): DEBUG: 12:23:09.957: Configuration is valid
** (generate:1483): DEBUG: 12:23:09.957: Generating output files..
** (generate:1483): DEBUG: 12:23:09.957: openvswitch: definition ens18 is not for us (backend 1)
** (generate:1483): DEBUG: 12:23:09.957: NetworkManager: definition ens18 is not for us (backend 1)
(generate:1483): GLib-DEBUG: 12:23:09.957: posix_spawn avoided (fd close requested)
(generate:1483): GLib-DEBUG: 12:23:09.961: posix_spawn avoided (fd close requested)
root@gb-ubuntu-srv [192.168.0.68]:/home/sa#
```

```
root@gb-ubuntu-srv [192.168.0.68]:/home/sa#netplan --debug apply && reboot now
** (generate:1491): DEBUG: 12:23:55.558: Processing input file /etc/netplan/00-installer-config.yaml..
** (generate:1491): DEBUG: 12:23:55.558: starting new processing pass
** (generate:1491): DEBUG: 12:23:55.558: We have some netdefs, pass them through a final round of validation
** (generate:1491): DEBUG: 12:23:55.558: ens18: setting default backend to 1
** (generate:1491): DEBUG: 12:23:55.558: Configuration is valid
** (generate:1491): DEBUG: 12:23:55.559: Generating output files..
** (generate:1491): DEBUG: 12:23:55.559: openvswitch: definition ens18 is not for us (backend 1)
** (generate:1491): DEBUG: 12:23:55.559: NetworkManager: definition ens18 is not for us (backend 1)
(generate:1491): GLib-DEBUG: 12:23:55.559: posix_spawn avoided (fd close requested)
(generate:1491): GLib-DEBUG: 12:23:55.565: posix_spawn avoided (fd close requested)
DEBUG:netplan generated networkd configuration changed, restarting networkd
DEBUG:ens18 not found in {}
DEBUG:Merged config:
network:
  ethernets:
    ens18:
      dhcp4: true
      nameservers:
        addresses:
        - 77.88.8.88
        - 77.88.8.2
  renderer: networkd
  version: 2

DEBUG:no netplan generated NM configuration exists
DEBUG:ens18 not found in {}
DEBUG:Merged config:
network:
  ethernets:
    ens18:
      dhcp4: true
      nameservers:
        addresses:
        - 77.88.8.88
        - 77.88.8.2
  renderer: networkd
  version: 2

DEBUG:Link changes: {}
DEBUG:netplan triggering .link rules for lo
DEBUG:netplan triggering .link rules for ens18
DEBUG:ens18 not found in {}
DEBUG:Merged config:
network:
  ethernets:
    ens18:
      dhcp4: true
      nameservers:
        addresses:
        - 77.88.8.88
        - 77.88.8.2
  renderer: networkd
  version: 2

client_loop: send disconnect: Connection reset
```

```
sa@gb-ubuntu-srv [192.168.0.243]:~$ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 86:9a:4e:46:b6:75 brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 192.168.0.243/24 brd 192.168.0.255 scope global dynamic ens18
       valid_lft 21440sec preferred_lft 21440sec
    inet6 fe80::849a:4eff:fe46:b675/64 scope link
       valid_lft forever preferred_lft forever
sa@gb-ubuntu-srv [192.168.0.243]:~$
```

3. **Изменить адрес DNS на 1.1.1.1 и проверить доступность интернета, например, открыв любой браузер на адрес https://geekbrains.ru.**

```
cat >/etc/netplan/00-installer-config.yaml<< _EOF_
network:
  version: 2
  renderer: networkd
  ethernets:
    ens18:
      dhcp4: yes
      nameservers:
        addresses:
          - 1.1.1.1
          - 1.1.2.2
_EOF_


netplan --debug generate
netplan --debug apply && reboot now
```

```
root@gb-ubuntu-srv [192.168.0.243]:/home/sa#cat >/etc/netplan/00-installer-config.yaml<< _EOF_
> network:
>   version: 2
>   renderer: networkd
>   ethernets:
>     ens18:
>       dhcp4: yes
>       nameservers:
>         addresses:
>           - 1.1.1.1
>           - 1.1.2.2
> _EOF_
root@gb-ubuntu-srv [192.168.0.243]:/home/sa#netplan --debug generate
DEBUG:command generate: running ['/lib/netplan/generate']
** (generate:1150): DEBUG: 12:28:29.070: Processing input file /etc/netplan/00-installer-config.yaml..
** (generate:1150): DEBUG: 12:28:29.070: starting new processing pass
** (generate:1150): DEBUG: 12:28:29.070: We have some netdefs, pass them through a final round of validation
** (generate:1150): DEBUG: 12:28:29.070: ens18: setting default backend to 1
** (generate:1150): DEBUG: 12:28:29.070: Configuration is valid
** (generate:1150): DEBUG: 12:28:29.071: Generating output files..
** (generate:1150): DEBUG: 12:28:29.071: openvswitch: definition ens18 is not for us (backend 1)
** (generate:1150): DEBUG: 12:28:29.071: NetworkManager: definition ens18 is not for us (backend 1)
(generate:1150): GLib-DEBUG: 12:28:29.071: posix_spawn avoided (fd close requested)
(generate:1150): GLib-DEBUG: 12:28:29.078: posix_spawn avoided (fd close requested)
root@gb-ubuntu-srv [192.168.0.243]:/home/sa#
```

```
sa@gb-ubuntu-srv [192.168.0.243]:~$nslookup ya.ru
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   ya.ru
Address: 87.250.250.242
Name:   ya.ru
Address: 2a02:6b8::2:242

sa@gb-ubuntu-srv [192.168.0.243]:~$cat /etc/resolv.conf
.bash_history              .bashrc                  .config/              homework04/              .profile                       test_2022_02_24.log
.bash_logout               .cache/                  homework03/           .local/                  .sudo_as_admin_successful
sa@gb-ubuntu-srv [192.168.0.243]:~$cat /etc/resolv.conf
.bash_history              .bashrc                  .config/              homework04/              .profile                       test_2022_02_24.log
.bash_logout               .cache/                  homework03/           .local/                  .sudo_as_admin_successful
sa@gb-ubuntu-srv [192.168.0.243]:~$cat /etc/resolv.conf
# This file is managed by man:systemd-resolved(8). Do not edit.
#
# This is a dynamic resolv.conf file for connecting local clients to the
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs must not access this file directly, but only through the
# symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a different way,
# replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 127.0.0.53
options edns0 trust-ad
sa@gb-ubuntu-srv [192.168.0.243]:~$ping ya.ru
PING ya.ru (87.250.250.242) 56(84) bytes of data.
64 bytes from ya.ru (87.250.250.242): icmp_seq=1 ttl=248 time=16.7 ms
64 bytes from ya.ru (87.250.250.242): icmp_seq=2 ttl=248 time=16.6 ms
64 bytes from ya.ru (87.250.250.242): icmp_seq=3 ttl=248 time=16.4 ms
^C
--- ya.ru ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 16.376/16.533/16.658/0.117 ms
sa@gb-ubuntu-srv [192.168.0.243]:~$
```

4. * **Настроить правила iptables,** чтобы из внешней сети можно было обратиться только к портам **80** и **443.** Запросы на порт **8080** перенаправлять на порт **80.**

5. * **Дополнительно к предыдущему заданию настроить доступ по ssh только из указанной сети.**

6. * **Настроить OpenVPN, связать несколько виртуальных машин с помощью OpenVPN-туннеля.**

7. * **Сделать одну из настроенных в задании выше машин шлюзом доступа в интернет. Настроить NAT.**