

ЛАБОРАТОРНАЯ РАБОТА №7

Студент: Талебу Тенке Франк

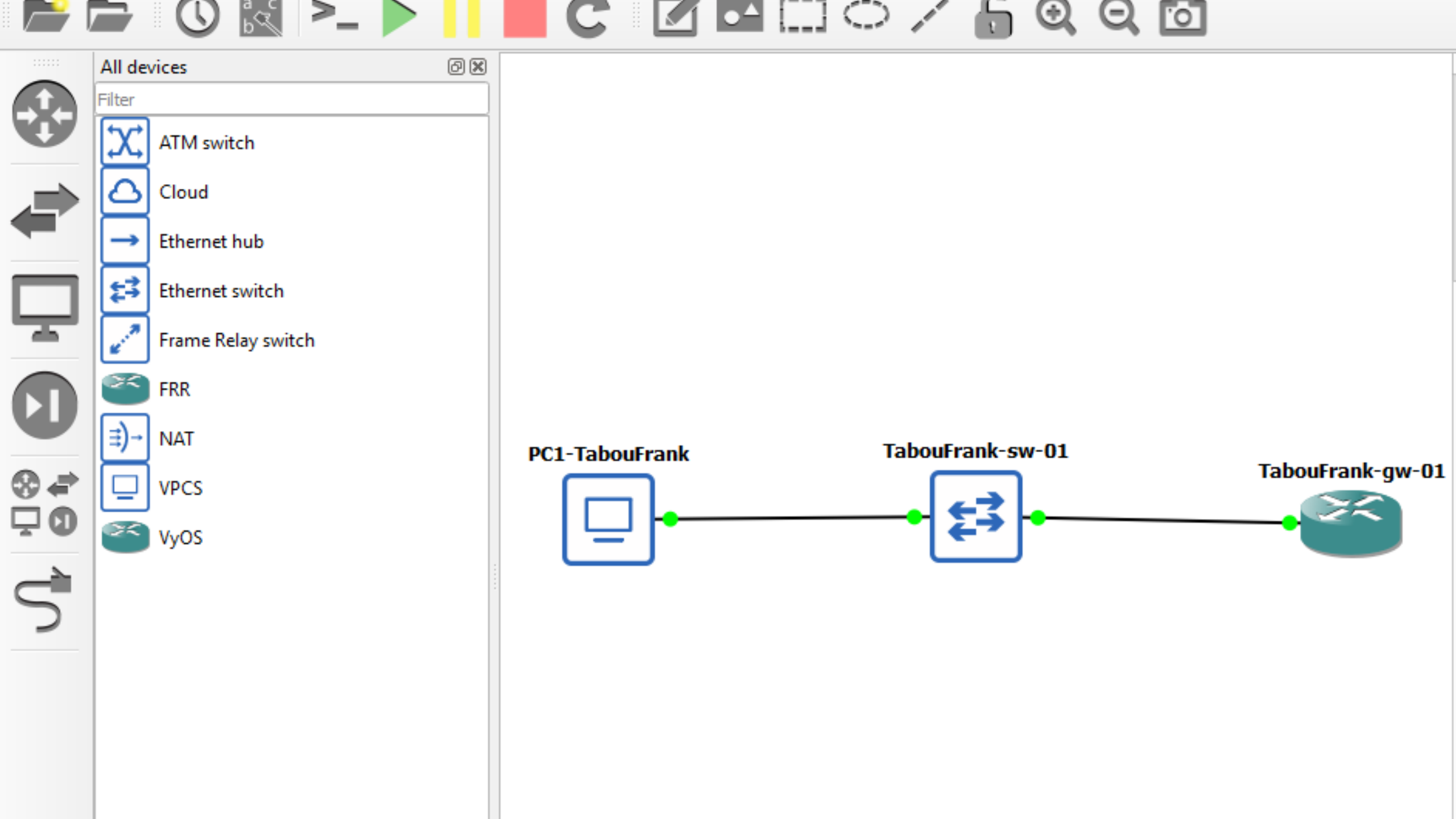
Группа: НФИбд-02-23


ЦЕЛЬ

Получить навыки настройки службы DHCP на сетевом оборудовании для распределения адресов IPv4 и IPv6.


ЗАДАНИЯ


1. Настройка DHCP в случае IPv4
2. Настройка DHCP в случае IPv6



 ATM switch Cloud

→ Ethernet hub

 Ethernet switch

 Frame Relay switch

 FRR
$$\Rightarrow \text{NAT}$$

☐ VPCS

 VyOS

Таблица 7.1

o	DNS
	—
	10.0.0.1 (DHCP)

0.0.0.1, DHCP-
10.0.0.253, на-
додать пакеты

в соответствии
утилизатор VyOS

присвойте на-

лизатор Wireshark [TabouFrank-sw-01 Ethernet1 to TabouFrank-gw-01 eth0]

PC1-TabouFrank



TabouFrank-sw-01



TabouFrank-gw-01



Welcome to VyOS - TabouFrank-gw-01 ttyS0

TabouFrank-gw-01 login: TabouFrank

Password:

Welcome to VyOS!

Check out project news at <https://blog.vyos.io>
and feel free to report bugs at <https://vyos.dev>

You can change this banner using "set system login banner post-login" command.

VyOS is a free software distribution that includes multiple components,
you can check individual component licenses under /usr/share/doc/*/copyright

TabouFrank@TabouFrank-gw-01:~\$ configure

[edit]

TabouFrank@TabouFrank-gw-01# delete system login user vyos

[edit]

TabouFrank@TabouFrank-gw-01# commit

[edit]

TabouFrank@TabouFrank-gw-01# save

Saving configuration to '/config/config.boot'...

Done

[edit]

TabouFrank@TabouFrank-gw-01#

TabouFrank-gw-01 login: TabouFrank

Password:

Welcome to VyOS!

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TabouFrank@TabouFrank-gw-01:~\$ configure

[edit]

TabouFrank@TabouFrank-gw-01# delete system login user vyos

[edit]

TabouFrank@TabouFrank-gw-01# commit

[edit]

TabouFrank@TabouFrank-gw-01# save

Saving configuration to '/config/config.boot'...

Done

[edit]

TabouFrank@TabouFrank-gw-01# set interfaces ethernet eth0 address 10.0.0.1/24

[edit]

nk domain-name TabouFrank.net

Configuration path: service dhcp-server [shared-network-nae] is not valid

Set failed

[edit]

nk domain-name TabouFrank.net et service dhcp-server shared-network-nae TabouFran

ank domain-name TabouFrank.netet service dhcp-server shared-network-name TabouFr

[edit]

```
VPCS> save
Saving startup configuration to startup.vpc
. done
```

```
VPCS> show ip
```

```
NAME           : VPCS[1]
IP/MASK         : 10.0.0.2/24
GATEWAY        : 10.0.0.1
DNS            : 10.0.0.1
DHCP SERVER    : 10.0.0.1
DHCP LEASE     : 86264, 86400/43200/75600
DOMAIN NAME    : TabouFrank.net
MAC            : 00:50:79:66:68:00
LPORT         : 10054
RHOST:PORT     : 127.0.0.1:10055
MTU            : 1500
```

```
VPCS> ping 10.0.0.1 -c 2
```

```
84 bytes from 10.0.0.1 icmp_seq=1 ttl=64 time=3.137 ms
84 bytes from 10.0.0.1 icmp_seq=2 ttl=64 time=2.496 ms
```

```
VPCS> █
```


Примените фильтр отображения ... <Ctrl-/>								
No.	Time	Source	Destination	Protocol	Length	Info		
246	4178.347772	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x875e35		
247	4183.707185	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x875e35		
248	4194.069897	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x875e35		
249	4214.976066	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x875e35		
250	4233.030940	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x875e35		
251	4296.885029	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xe5701a2f		
252	4302.592174	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xe5701a2f		
253	4311.248619	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xe5701a2f		
254	4320.414823	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xe5701a2f		
255	4335.146032	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xe5701a2f		
256	4353.300318	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0xe5701a2f		
257	4434.640433	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
258	4439.104756	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
259	4443.488667	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
260	4447.740925	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
261	4458.571266	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
262	4474.900938	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
263	4493.115709	0.0.0.0	255.255.255.255	DHCP	342	DHCP Discover - Transaction ID 0x461dae55		
264	4822.664598	0.0.0.0	255.255.255.255	DHCP	406	DHCP Discover - Transaction ID 0xbd3c0452		
265	4822.670141	0c:31:84:6b:00:00	Broadcast	ARP	60	Who has 10.0.0.2? Tell 10.0.0.1		
Checksum: 0x9234 [unverified] [Checksum Status: Unverified] [Stream index: 0] [Stream Packet Number: 247] > [Timestamps] UDP payload (300 bytes)								
Dynamic Host Configuration Protocol (Discover)								
Message type: Boot Request (1) Hardware type: Ethernet (0x01) Hardware address length: 6 Hops: 0 Transaction ID: 0x461dae55 Seconds elapsed: 23 > Bootp flags: 0x0000 (Unicast) Client IP address: 0.0.0.0 Your (client) IP address: 0.0.0.0 Next server IP address: 0.0.0.0 Relay agent IP address: 0.0.0.0								
0000	ff	ff	ff	ff	ff	0c 31	84 6b 00 00 08 00 45 10	.....1
0010	01	48	00	00	00	80 11	39 96 00 00 00 00 ff ff	·H.....9
0020	ff	ff	00	44	00	43 01 34	92 34 01 01 06 00 46 1d	···D·C·4
0030	ae	55	00	17	00	00 00 00	00 00 00 00 00 00 00 00	·U.....
0040	00	00	00	00	00	00 0c 31	84 6b 00 00 00 00 00 00	.....1
0050	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
0060	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
0070	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
0080	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
0090	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
00a0	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
00b0	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
00c0	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
00d0	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
00e0	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
00f0	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
0100	00	00	00	00	00	00 00 00	00 00 00 00 00 00 00 00	.....
0110	00	00	00	00	00	63 82	53 63 35 01 01 0c 10 54	.....c·S
0120	61	62	6f	75	46	72 61 6e	6b 2d 67 77 2d 30 31 37	abouFran k
0130	07	01	1c	03	06	79 0f 1a	ff 00 00 00 00 00 00 00	·····y·

Required files

Please select one version of Kali Linux and import the required files. Files are searched in your downloads and GNS3 images directories by default



Appliance version and files	Size	Status
▼ Kali Linux version 2021.1	3.4 GB	Missing files
kali-linux-persistence-1gb.qcow2	33.1 MB	Found on gns3vm (controller)
kali-linux-2021.1-live-amd64.iso	3.3 GB	Missing
▶ Kali Linux version 2019.3	2.9 GB	Ready to install
▼ Kali Linux version 2019.2	3.2 GB	Missing files
kali-linux-persistence-1gb.qcow2	33.1 MB	Found on gns3vm (controller)
kali-linux-2019.2-amd64.iso	3.1 GB	Missing
▼ Kali Linux version 2019.2 (MATE)	3.1 GB	Missing files
kali-linux-persistence-1gb.qcow2	33.1 MB	Found on gns3vm (controller)
kali-linux-mate-2019.2-amd64.iso	3.1 GB	Missing
▼ Kali Linux version 2019.1a	3.3 GB	Missing files
kali-linux-persistence-1gb.qcow2	33.1 MB	Found on gns3vm (controller)
kali-linux-2019.1a-amd64.iso	3.2 GB	Missing
▼ Kali Linux version 2018.4	3.0 GB	Missing files
kali-linux-persistence-1gb.qcow2	33.1 MB	Found on gns3vm (controller)

☐ Allow custom files

Create a new version

Refresh

[Appliance info](#)[< Back](#)[Next >](#)[Cancel](#)

KALI

"the quieter you become, the more you are able to hear"

Boot menu

- Live (amd64)
- Live (amd64 failsafe)
- Live (forensic mode)
- Live USB Persistence (check kali.org/prst)
- Live USB Encrypted Persistence (check kali.org/prst)
- Install
- Graphical install
- Install with speech synthesis
- Advanced options

k-sw-03

PC3-TabouFrank

“the quieter you become, the more you are able to hear”

Boot menu

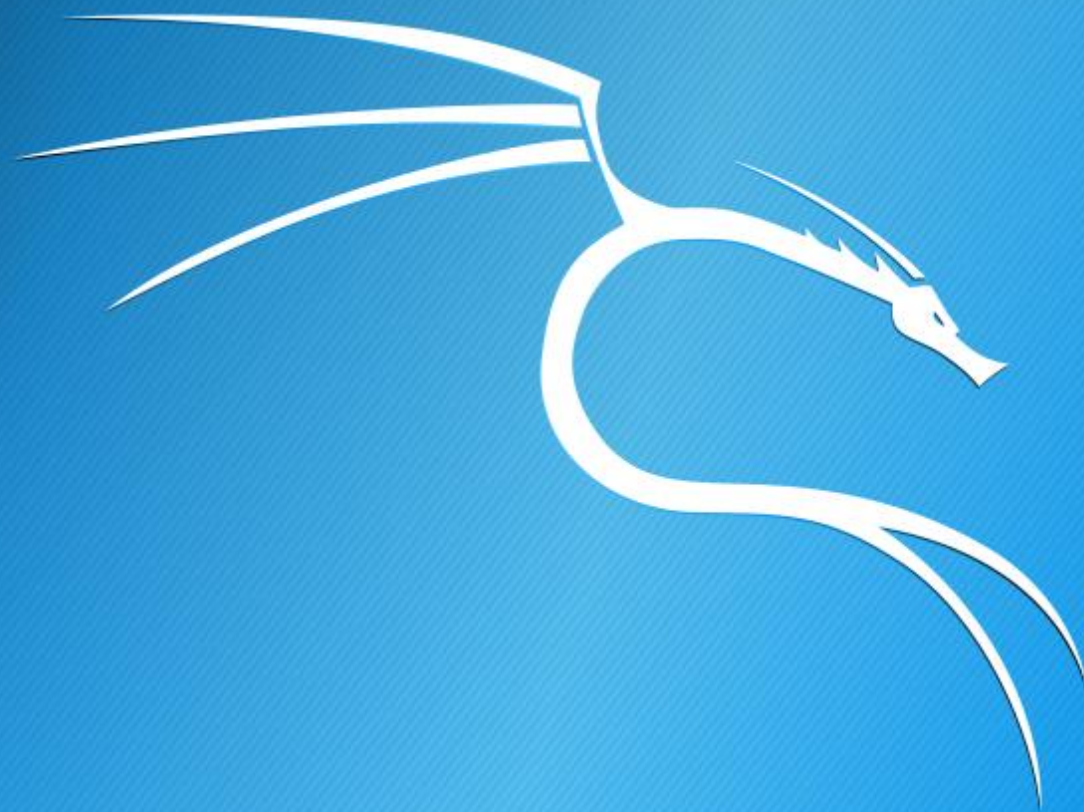
Live (amd64)
Live (amd64 failsafe)
Live (forensic mode)
Live USB Persistence (check kali.org/prst)
Live USB Encrypted Persistence (check kali.org/prst)
Install
Graphical install
Install with speech synthesis
Advanced options >



Load installer components from CD



Retrieving nic-modules-5.2.0-kali2-amd64-di





```
root@kali: ~
File Edit View Search Terminal Help
root@kali:~# ip address
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: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 0c:5e:74:8b:00:00 brd ff:ff:ff:ff:ff:ff
    inet6 200::9c82:f116:f5ef:c243/64 scope global dynamic noprefixroute
        valid_lft 2591863sec preferred_lft 14263sec
    inet6 fe80::bb01:ed50:70f4:5a87/64 scope link noprefixroute
        valid_lft forever preferred_lft forever
3: eth1: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state DOWN group default qlen 1000
    link/ether 0c:5e:74:8b:00:01 brd ff:ff:ff:ff:ff:ff
4: eth2: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state DOWN group default qlen 1000
    link/ether 0c:5e:74:8b:00:02 brd ff:ff:ff:ff:ff:ff
5: eth3: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc pfifo_fast state DOWN group default qlen 1000
    link/ether 0c:5e:74:8b:00:03 brd ff:ff:ff:ff:ff:ff
```

```
root@kali:~# ping 2000::1 -c 2
PING 2000::1(2000::1) 56 data bytes

--- 2000::1 ping statistics ---
2 packets transmitted, 0 received, 100% packet loss, time 1025ms

root@kali:~# ping 2000::1 -c 2
PING 2000::1(2000::1) 56 data bytes

--- 2000::1 ping statistics ---
2 packets transmitted, 0 received, 100% packet loss, time 1005ms
```

```
root@kali:~# ip -6 rout show
::1 dev lo proto kernel metric 256 pref medium
200::/64 dev eth0 proto ra metric 100 pref medium
fe80::/64 dev eth0 proto kernel metric 100 pref medium
default via fe80::e31:84ff:fe6b:1 dev eth0 proto ra metric 100 pref medium
root@kali:~#
```


Welcome to VyOS!

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and feel free to report bugs at <https://vyos.dev>

You can change this banner using "set system login banner post-login" command.

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```
TabouFrank@TabouFrank-gw-01:~$ configure
```

```
[edit]
```

```
TabouFrank@TabouFrank-gw-01# set service router-advert interface eth2 managed-fl  
ag
```

```
[edit]
```

```
TabouFrank@TabouFrank-gw-01# set service dhcpv6-server shared-network-name Tabou  
Frank-stateful
```

```
[edit]
```

```
TabouFrank@TabouFrank-gw-01# set service dhcpv6-server shared-network-name Tabou  
Frank-stateful subnet 2001::0/64
```

```
[edit]
```

```
TabouFrank@TabouFrank-gw-01# set service dhcpv6-server shared-network-name Tabou  
Frank-stateful subnet 2001::0/64 name-server 2001::1
```

```
[edit]
```

```
TabouFrank@TabouFrank-gw-01# set service dhcpv6-server shared-network-name Tabou  
Frank-stateful subnet 2001::0/64 domain-search TabouFrank.net
```

```
[edit]
```

```
TabouFrank@TabouFrank-gw-01# set service dhcpv6-server shared-network-name Tabou  
Frank-stateful subnet 2001::0/64 address-range start 2001::100 stop 2001::199
```

```
[edit]
```

18. Вновь на узле PC3 проверьте настройки сети, пропингуйте, проверьте настройки DNS:
- ```
root@PC3-username:/# ip address
root@PC3-username:/# ip -6 route show
root@PC3-username:/# ping 2001::1 -c 2
root@PC3-username:/# cat /etc/resolv.conf
```
19. На маршрутизаторе посмотрите статистику DHCP-сервера:
- ```
username@username-gw-01# run show dhcpv6 se
```
20. В отчёте поясните выведенную на маршрутизаторе и а также проанализируйте захваченные анализатором трассируемые к работе DHCPv6 и назначению адреса устройс

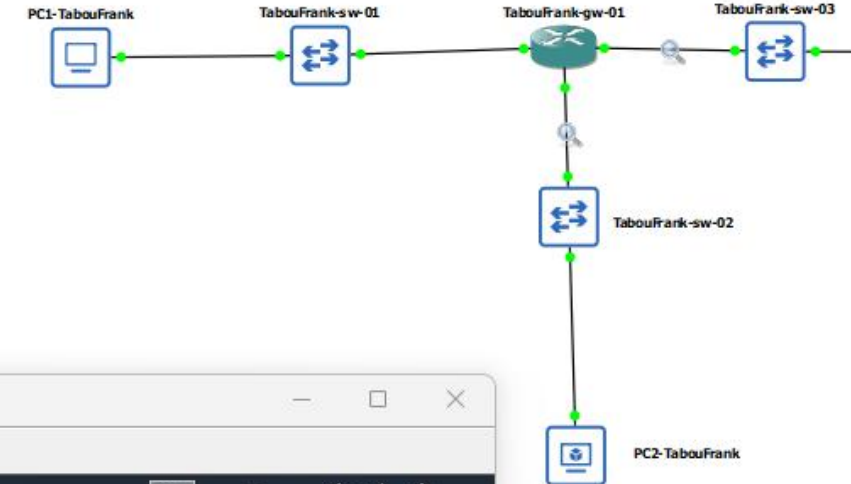
7.4. Содержание отчёта

1. Титульный лист с указанием номера лабораторной работы.
2. Формулировка задания работы.
3. Описание результатов выполнения задания:
 - скриншоты (снимки экрана), фиксирующие выполнение работы;

End devices

Filter

- Cloud
- Kali Linux
- NAT
- VPCS



QEMU (PC3-TabouFrank) - TightVNC Viewer

Applications ▾ Places ▾

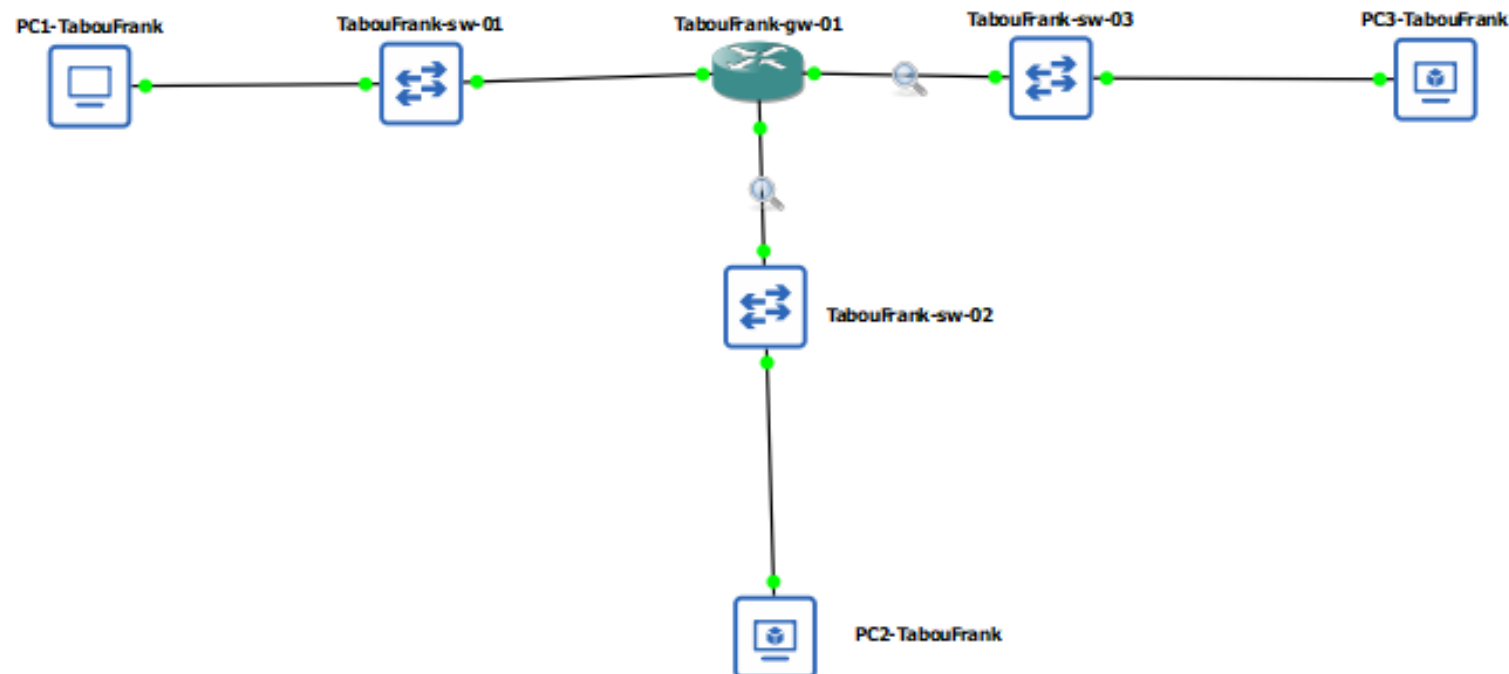
Sun 15:52

1 [Speaker Icon] [Power Icon]





NAT
VPCS



+ New template

Console

Sorry, it is not possible to rename a node that is already powered on
Error while creating node from template: 'Kali-Linux-2019.3
-1' is an invalid name to create a Qemu node
Could not upload image kali-linux-persistence-1gb.qcow2: Database error detected, please check logs to find details
Error while creating node from template: 'Kali-Linux-2019.3
-2' is an invalid name to create a Qemu node
Cannot start console application: AUX console port not allocated for KaliLinux-1
Error while creating node from template: 'Kali-Linux-2019.3
-3' is an invalid name to create a Qemu node
Could not upload image kali-linux-2019.3-amd64.iso: Database error detected, please check logs to find details
Image 'kali-linux-persistence-50gb.qcow2' could not be found in the controller database
This node must be started before a console can be opened
Sorry, it is not possible to rename a node that is already powered on
This node must be started before a console can be opened
This node must be started before a console can be opened

ВЫВОДЫ

В процессе выполнения лабораторной работы я получил навыки настройки службы DHCP на сетевом оборудовании для распределения адресов IPv4 и IPv6.