ЛАБОРАТОРНАЯ РАБОТА №5

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Группа: НФИбд-02-23

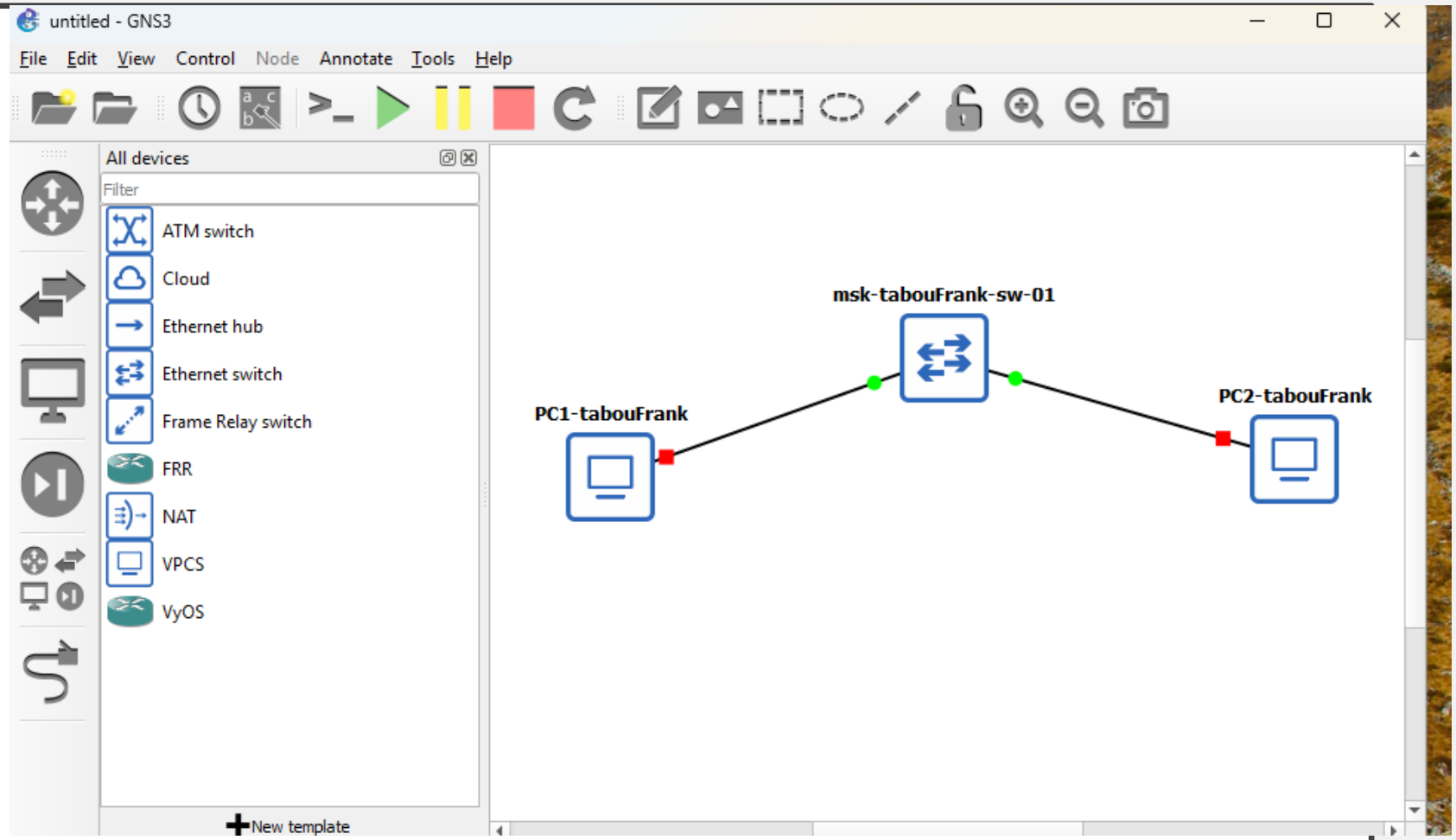
ЦЕЛЬ РАБОТА

Построить простейшие модели сетей на базе коммутатора и маршрутизаторов FRR и VyOS в GNS3, проанализировать трафик посредством Wireshark.

ЗАДАНИЕ

- Смоделировать простейшую сеть на базе коммутатора в GNS3;
- Проанализировать трафик в GNS3 посредством Wireshark;
- Смоделировать простейшую сеть на базе маршрутизатора FRR в GNS3;
- Смоделировать простейшую сеть на базе маршрутизатора VyOS в GNS3.

ВЫПОЛНЕНИЕ ЛАБОРАТОРНОЙ РАБОТЫ



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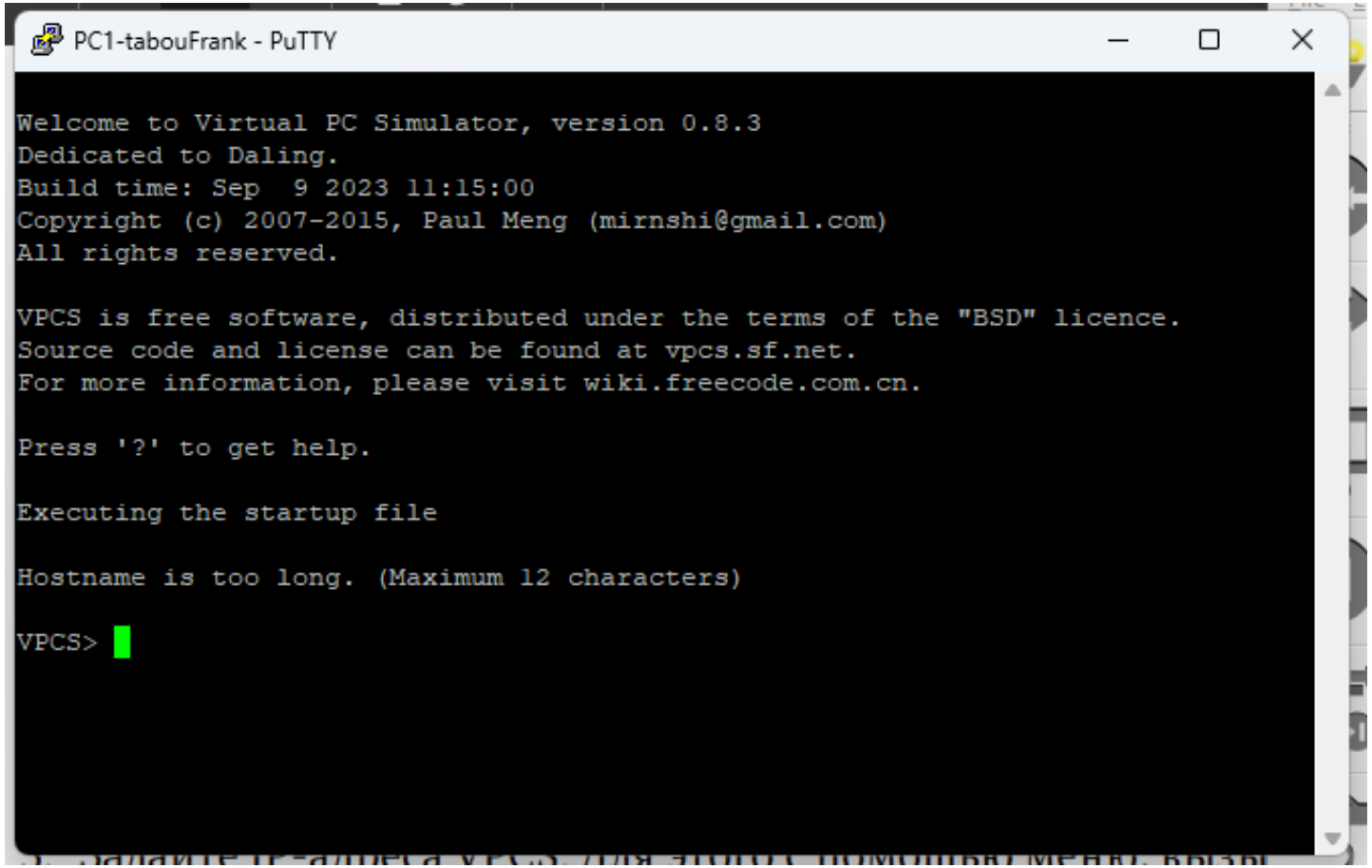


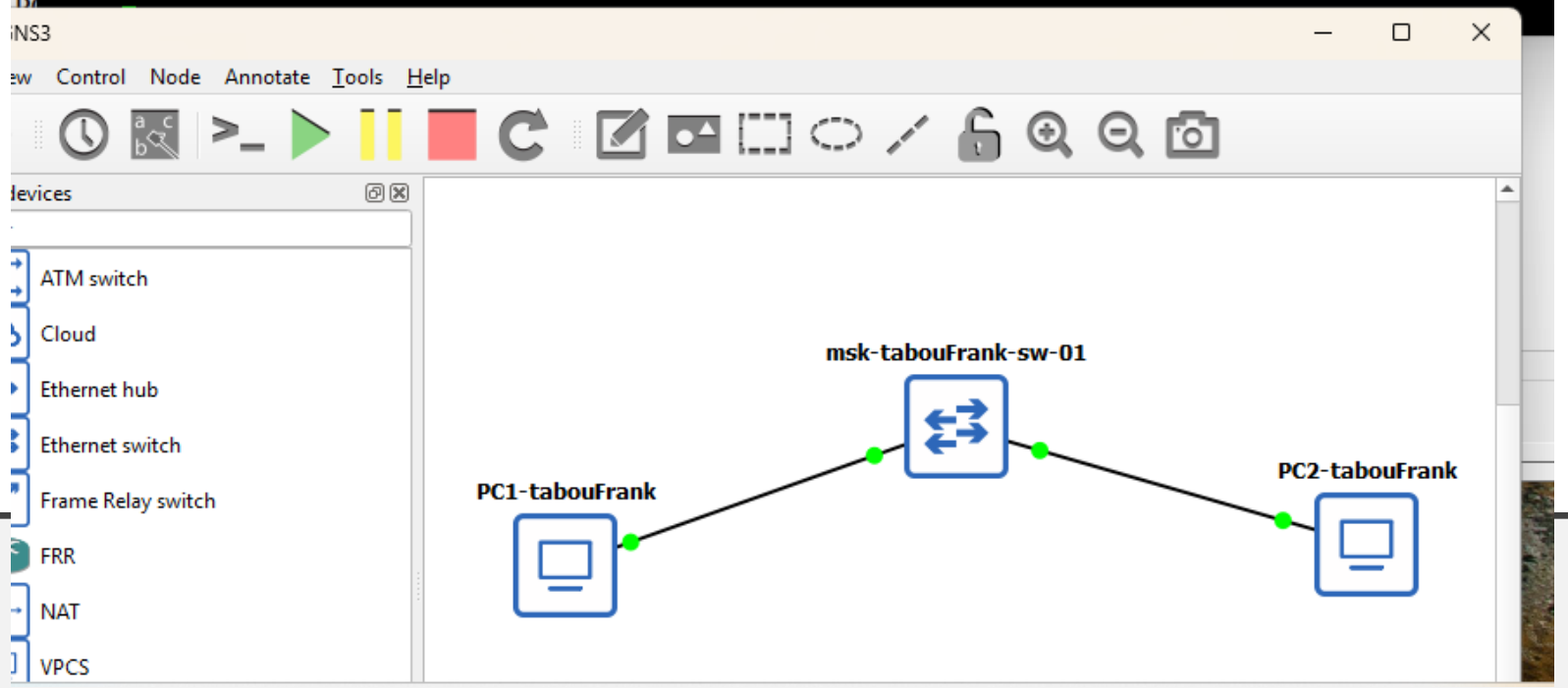
ВЫПОЛНЕНИЕ ЛАБОРАТОРНОЙ РАБОТЫ

ВЫПОЛНЕНИЕ ЛАБОРАТОРНОЙ РАБОТЫ

```
VPCS> /?

?                       Print help
arp                       Shortcut for: show arp. Show arp table
clear ARG               Clear IPv4/IPv6, arp/neighbor cache, command history
dhcp [OPTION]           Shortcut for: ip dhcp. Get IPv4 address via DHCP
disconnect              Exit the telnet session (daemon mode)
echo TEXT               Display TEXT in output. See also  set echo ?
help                    Print help
history                 Shortcut for: show history. List the command history
ip ARG ... [OPTION]     Configure the current VPC's IP settings. See ip ?
load [FILENAME]         Load the configuration/script from the file FILENAME
ping HOST [OPTION ...]  Ping HOST with ICMP (default) or TCP/UDP. See ping ?
quit                    Quit program
relay ARG ...           Configure packet relay between UDP ports. See relay ?
rlogin [ip] port        Telnet to port on host at ip (relative to host PC)
save [FILENAME]         Save the configuration to the file FILENAME
set ARG ...             Set VPC name and other options. Try set ?
show [ARG ...]          Print the information of VPCs (default). See show ?
sleep [seconds] [TEXT]  Print TEXT and pause running script for seconds
trace HOST [OPTION ...] Print the path packets take to network HOST
version                 Shortcut for: show version

To get command syntax help, please enter '?' as an argument of the command.

VPCS> ip 192.168.1.12/24 192.168.1.1
Checking for duplicate address...
VPCS : 192.168.1.12 255.255.255.0 gateway 192.168.1.1

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

VPCS>
```

ВЫПОЛНЕНИЕ ЛАБОРАТОРНОЙ РАБОТЫ

```
VPCS> ping

ping HOST [OPTION ...]
  Ping the network HOST. HOST can be an ip address or name
    Options:
     -1             ICMP mode, default
     -2             UDP mode
     -3             TCP mode
     -c count       Packet count, default 5
     -D             Set the Don't Fragment bit
     -f FLAG        Tcp header FLAG |C|E|U|A|P|R|S|F|
                                bits |7 6 5 4 3 2 1 0|
     -i ms          Wait ms milliseconds between sending each packet
     -l size        Data size
     -P protocol    Use IP protocol in ping packets
                      1 - ICMP (default), 17 - UDP, 6 - TCP
     -p port        Destination port
     -s port        Source port
     -T ttl         Set ttl, default 64
     -t             Send packets until interrupted by Ctrl+C
     -w ms          Wait ms milliseconds to receive the response

  Notes: 1. Using names requires DNS to be set.
         2. Use Ctrl+C to stop the command.
```



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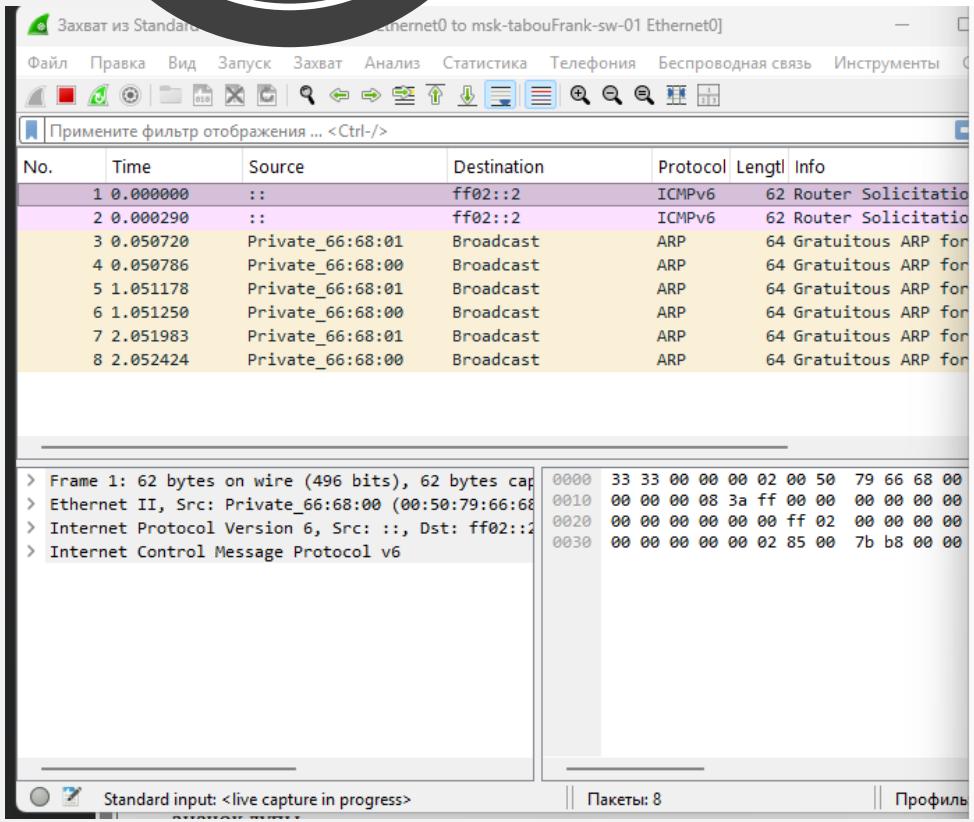

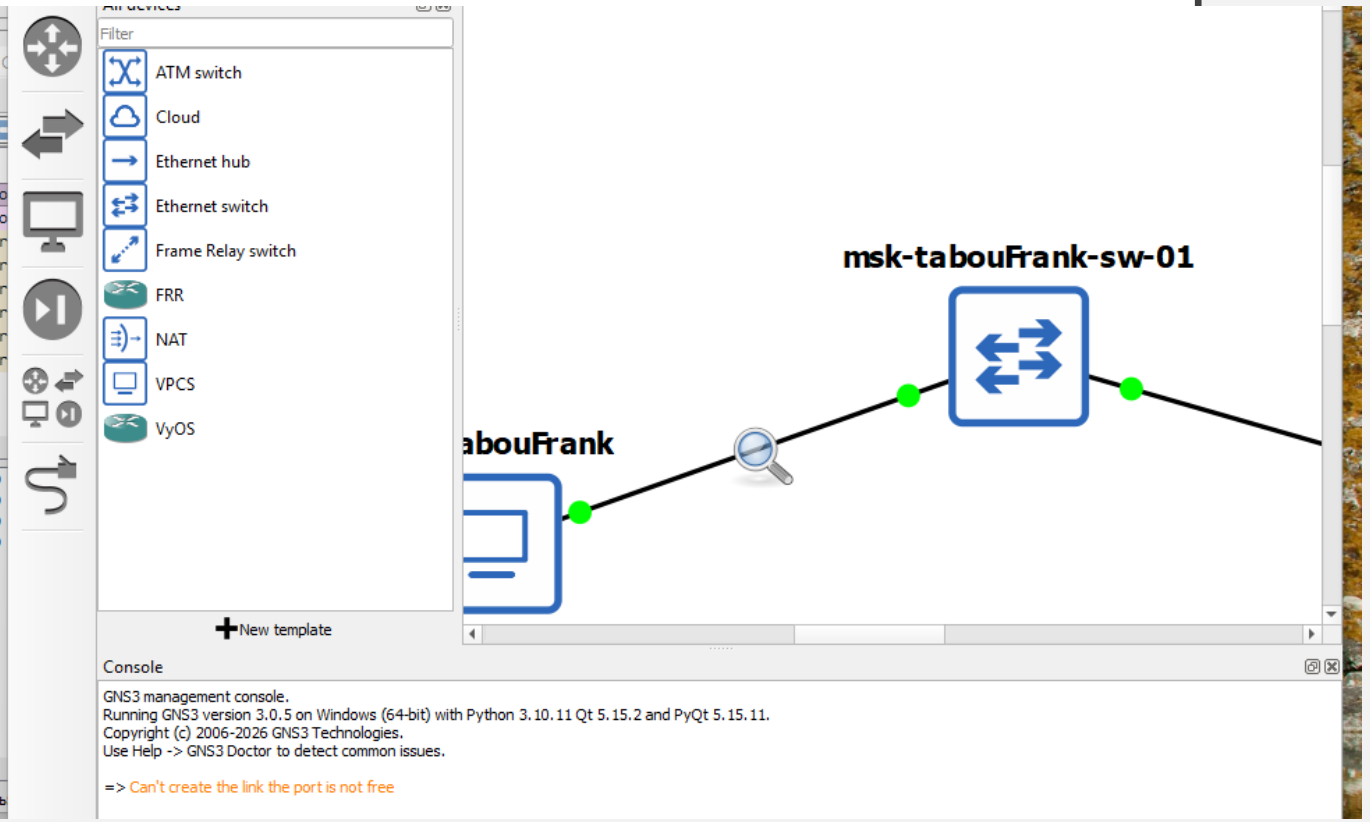

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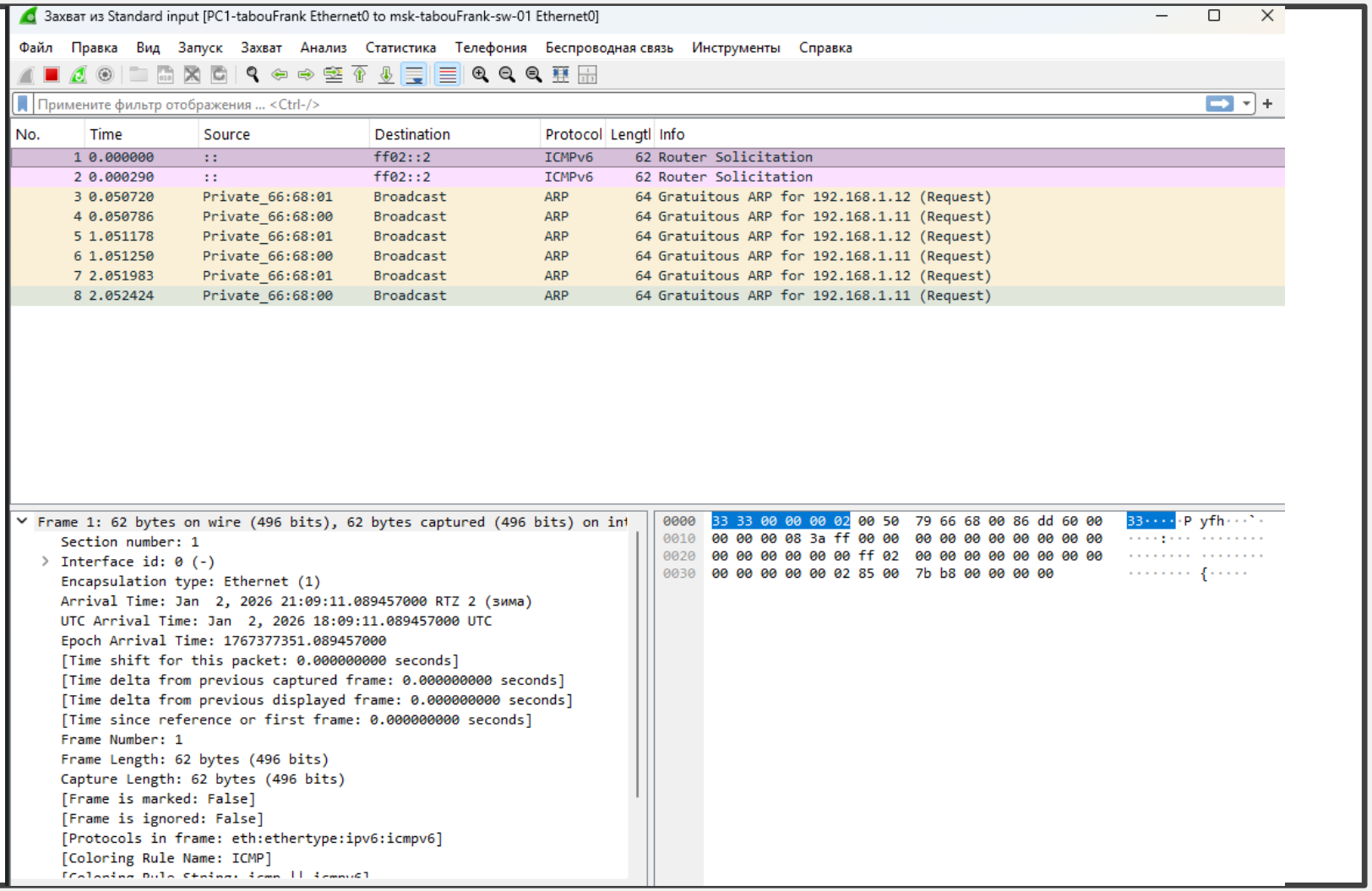

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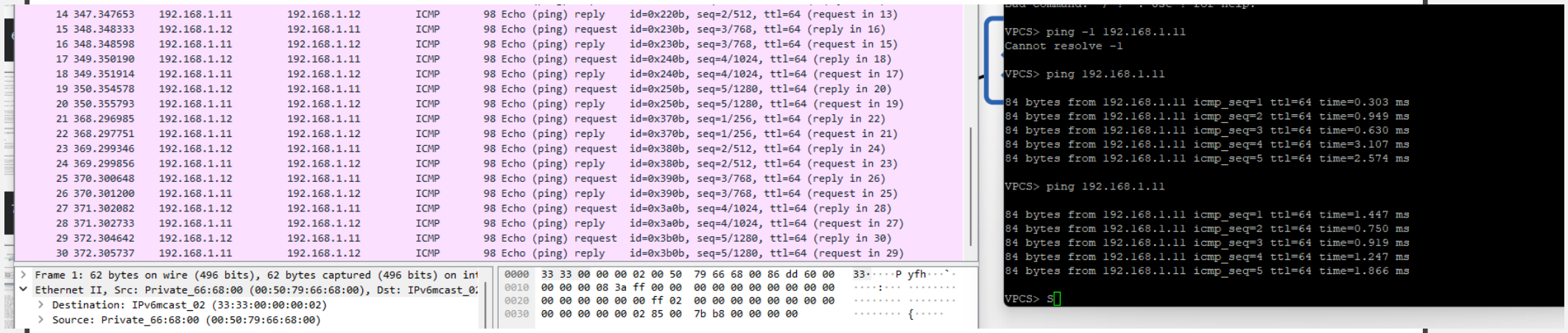

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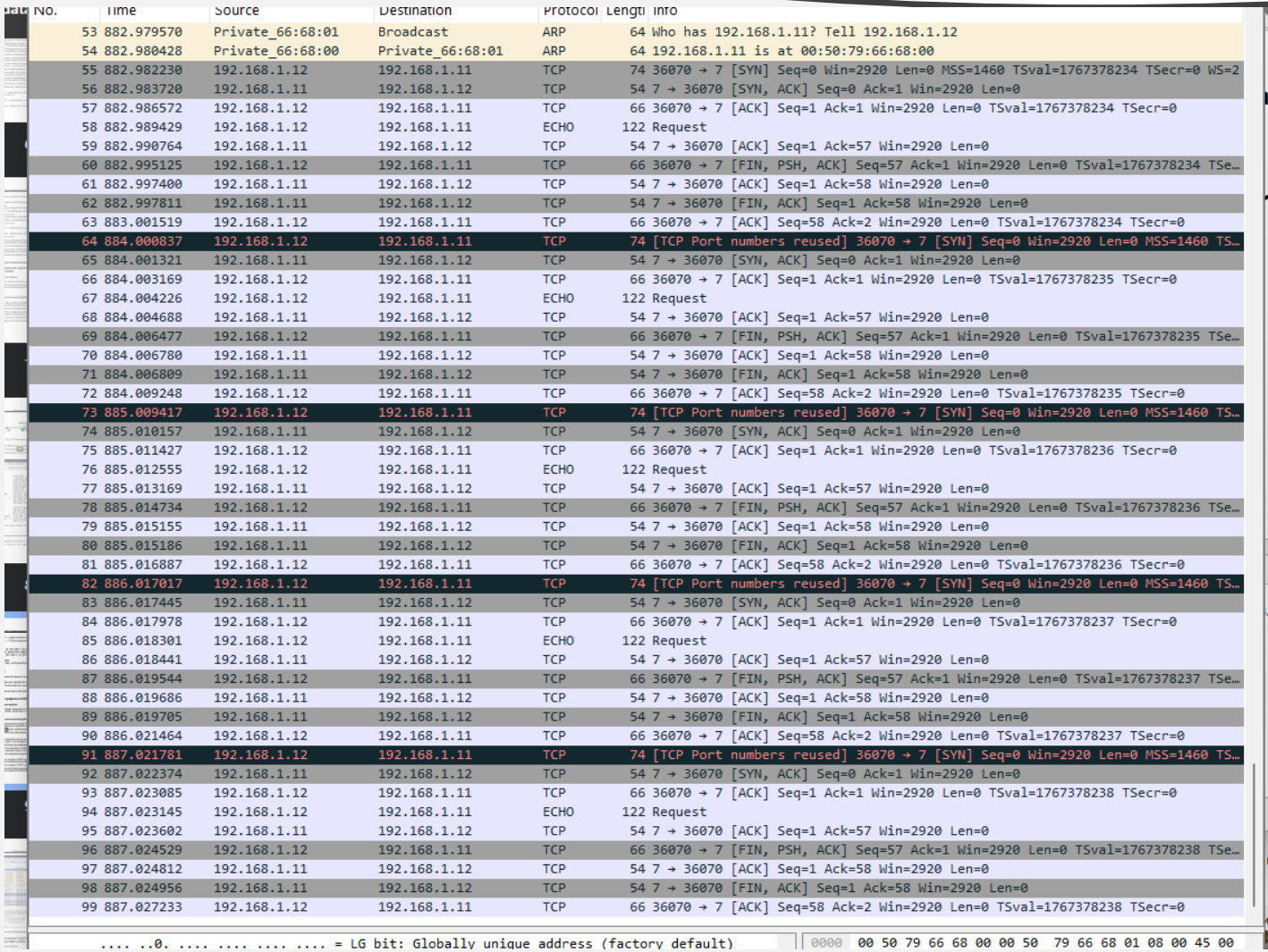
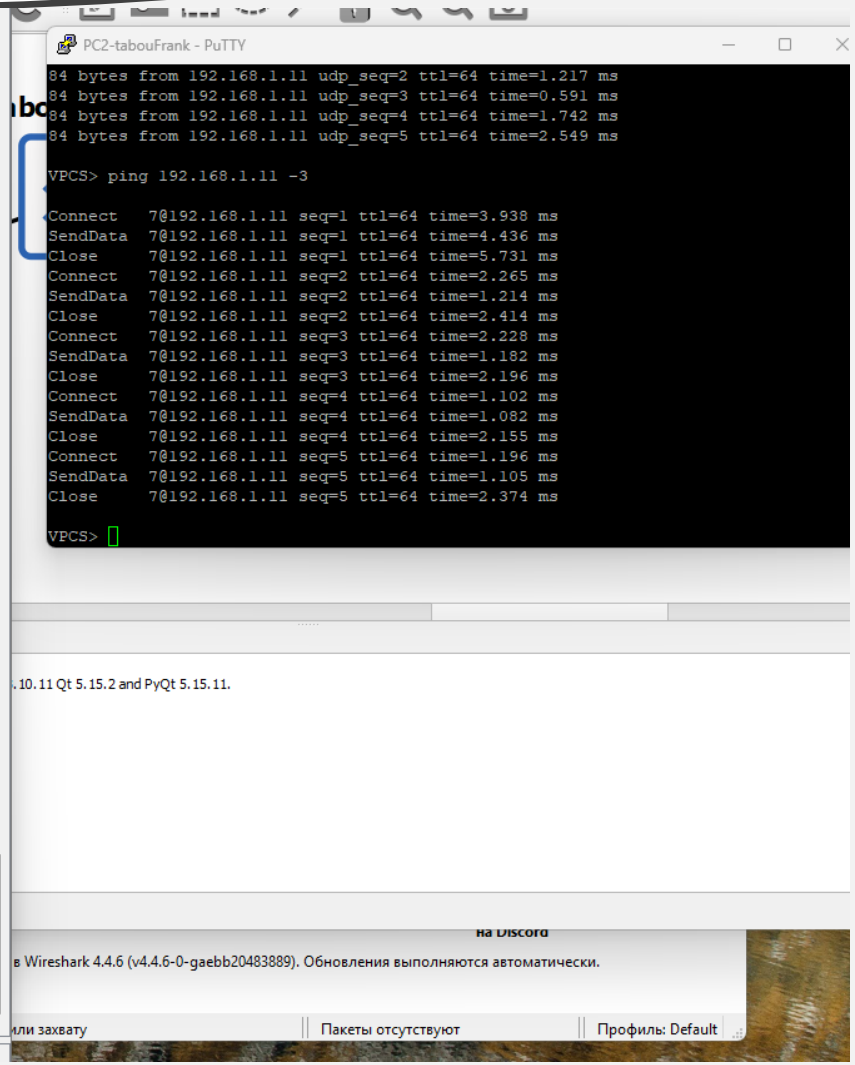


No.	Time	Source	Destination	Protocol	Length	Info
53	882.979570	Private_66:68:01	Broadcast	ARP	64	Who has 192.168.1.11? Tell 192.168.1.12
54	882.980428	Private_66:68:00	Private_66:68:01	ARP	64	192.168.1.11 is at 00:50:79:66:68:00
55	882.982230	192.168.1.12	192.168.1.11	TCP	74	36070 → 7 [SYN] Seq=0 Win=2920 Len=0 MSS=1460 TSval=1767378234 TSecr=0 WS=2
56	882.983720	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [SYN, ACK] Seq=0 Ack=1 Win=2920 Len=0
57	882.986572	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=1 Ack=1 Win=2920 Len=0 TSval=1767378234 TSecr=0
58	882.989429	192.168.1.12	192.168.1.11	ECHO	122	Request
59	882.990764	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=57 Win=2920 Len=0
60	882.995125	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [FIN, PSH, ACK] Seq=57 Ack=1 Win=2920 Len=0 TSval=1767378234 TSe…
61	882.997400	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=58 Win=2920 Len=0
62	882.997811	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [FIN, ACK] Seq=1 Ack=58 Win=2920 Len=0
63	883.001519	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=58 Ack=2 Win=2920 Len=0 TSval=1767378234 TSecr=0
64	884.000837	192.168.1.12	192.168.1.11	TCP	74	[TCP Port numbers reused] 36070 → 7 [SYN] Seq=0 Win=2920 Len=0 MSS=1460 TS…
65	884.001321	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [SYN, ACK] Seq=0 Ack=1 Win=2920 Len=0
66	884.003169	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=1 Ack=1 Win=2920 Len=0 TSval=1767378235 TSecr=0
67	884.004226	192.168.1.12	192.168.1.11	ECHO	122	Request
68	884.004688	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=57 Win=2920 Len=0
69	884.006477	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [FIN, PSH, ACK] Seq=57 Ack=1 Win=2920 Len=0 TSval=1767378235 TSe…
70	884.006780	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=58 Win=2920 Len=0
71	884.006809	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [FIN, ACK] Seq=1 Ack=58 Win=2920 Len=0
72	884.009248	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=58 Ack=2 Win=2920 Len=0 TSval=1767378235 TSecr=0
73	885.009417	192.168.1.12	192.168.1.11	TCP	74	[TCP Port numbers reused] 36070 → 7 [SYN] Seq=0 Win=2920 Len=0 MSS=1460 TS…
74	885.010157	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [SYN, ACK] Seq=0 Ack=1 Win=2920 Len=0
75	885.011427	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=1 Ack=1 Win=2920 Len=0 TSval=1767378236 TSecr=0
76	885.012555	192.168.1.12	192.168.1.11	ECHO	122	Request
77	885.013169	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=57 Win=2920 Len=0
78	885.014734	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [FIN, PSH, ACK] Seq=57 Ack=1 Win=2920 Len=0 TSval=1767378236 TSe…
79	885.015155	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=58 Win=2920 Len=0
80	885.015186	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [FIN, ACK] Seq=1 Ack=58 Win=2920 Len=0
81	885.016887	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=58 Ack=2 Win=2920 Len=0 TSval=1767378236 TSecr=0
82	886.017017	192.168.1.12	192.168.1.11	TCP	74	[TCP Port numbers reused] 36070 → 7 [SYN] Seq=0 Win=2920 Len=0 MSS=1460 TS…
83	886.017445	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [SYN, ACK] Seq=0 Ack=1 Win=2920 Len=0
84	886.017978	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=1 Ack=1 Win=2920 Len=0 TSval=1767378237 TSecr=0
85	886.018301	192.168.1.12	192.168.1.11	ECHO	122	Request
86	886.018441	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=57 Win=2920 Len=0
87	886.019544	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [FIN, PSH, ACK] Seq=57 Ack=1 Win=2920 Len=0 TSval=1767378237 TSe…
88	886.019686	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=58 Win=2920 Len=0
89	886.019705	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [FIN, ACK] Seq=1 Ack=58 Win=2920 Len=0
90	886.021464	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=58 Ack=2 Win=2920 Len=0 TSval=1767378237 TSecr=0
91	887.021781	192.168.1.12	192.168.1.11	TCP	74	[TCP Port numbers reused] 36070 → 7 [SYN] Seq=0 Win=2920 Len=0 MSS=1460 TS…
92	887.022374	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [SYN, ACK] Seq=0 Ack=1 Win=2920 Len=0
93	887.023085	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=1 Ack=1 Win=2920 Len=0 TSval=1767378238 TSecr=0
94	887.023145	192.168.1.12	192.168.1.11	ECHO	122	Request
95	887.023602	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=57 Win=2920 Len=0
96	887.024529	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [FIN, PSH, ACK] Seq=57 Ack=1 Win=2920 Len=0 TSval=1767378238 TSe…
97	887.024812	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [ACK] Seq=1 Ack=58 Win=2920 Len=0
98	887.024956	192.168.1.11	192.168.1.12	TCP	54	7 → 36070 [FIN, ACK] Seq=1 Ack=58 Win=2920 Len=0
99	887.027233	192.168.1.12	192.168.1.11	TCP	66	36070 → 7 [ACK] Seq=58 Ack=2 Win=2920 Len=0 TSval=1767378238 TSecr=0

.... ..0. .... = LG bit: Globally unique address (factory default)

0000 00 50 79 66 68 00 00 50 79 66 68 01 08 00 45 00



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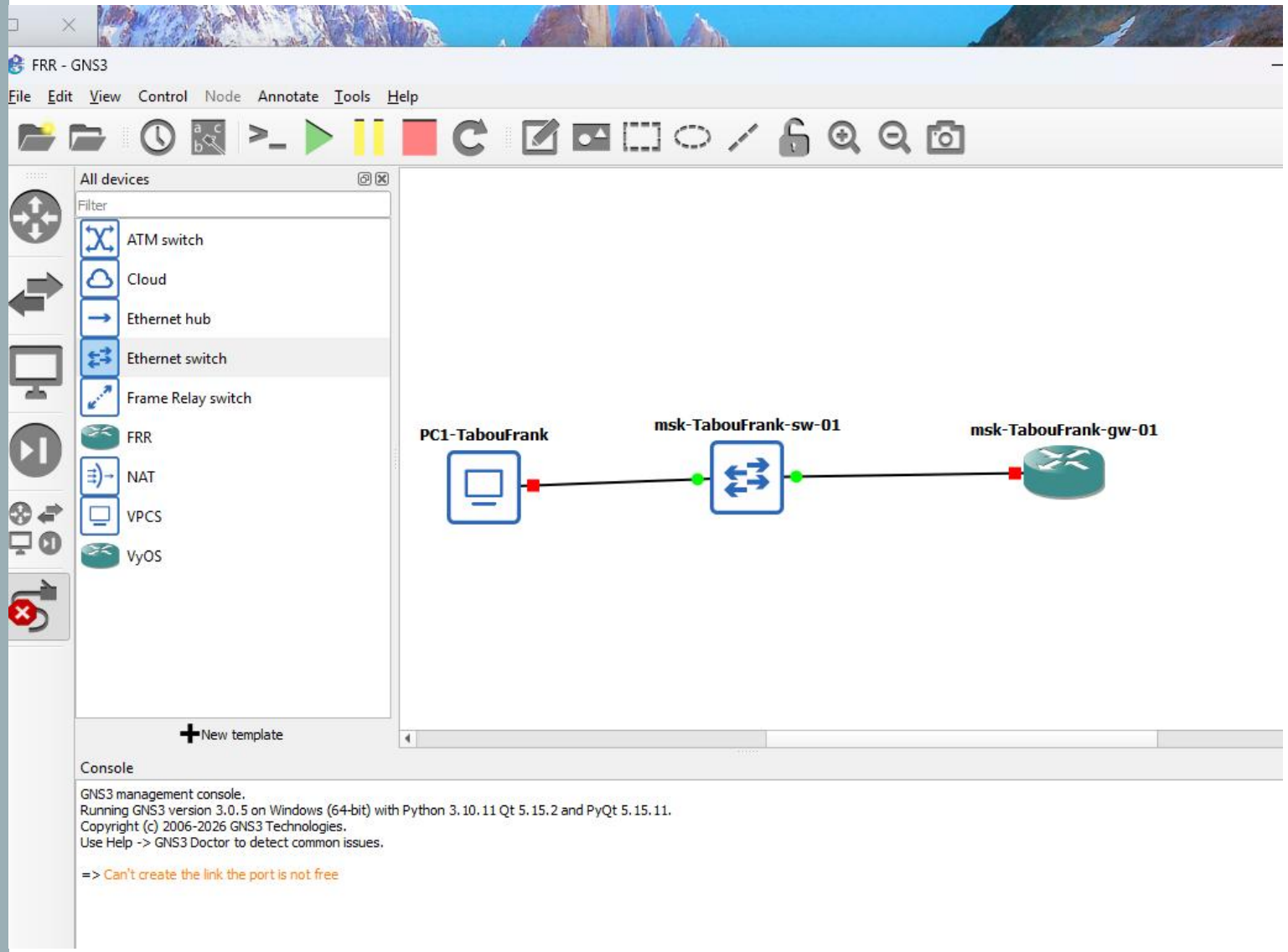

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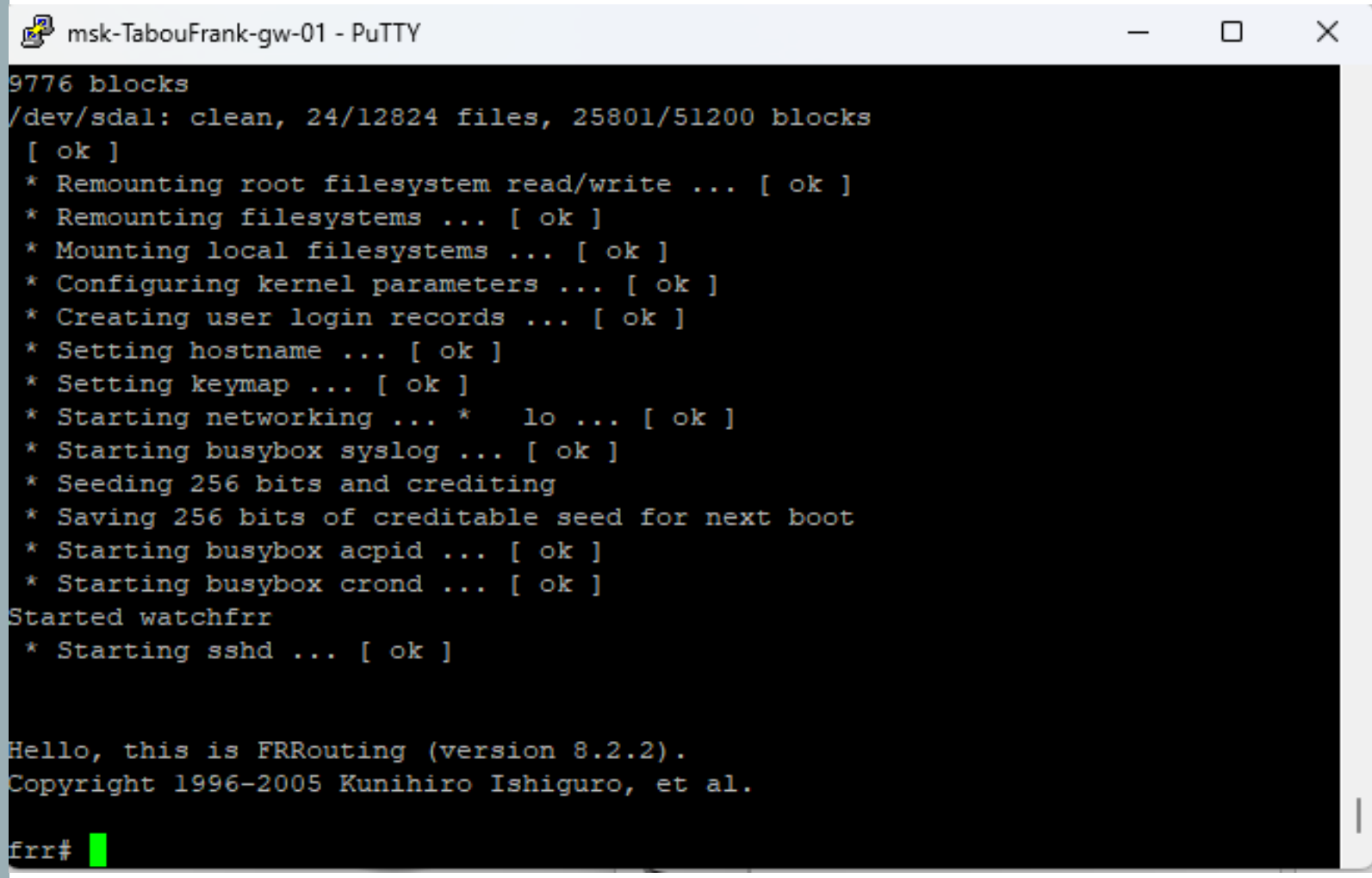

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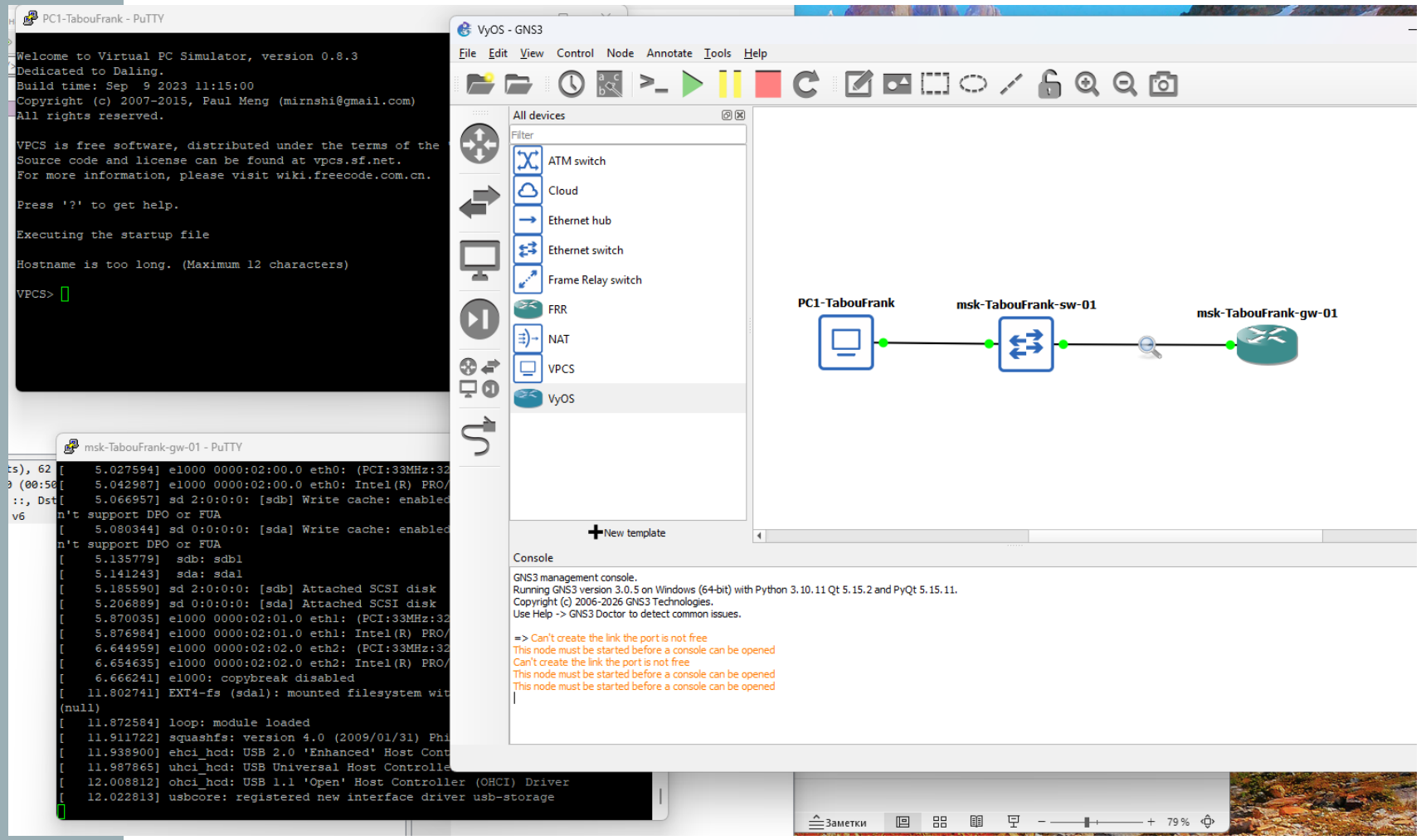

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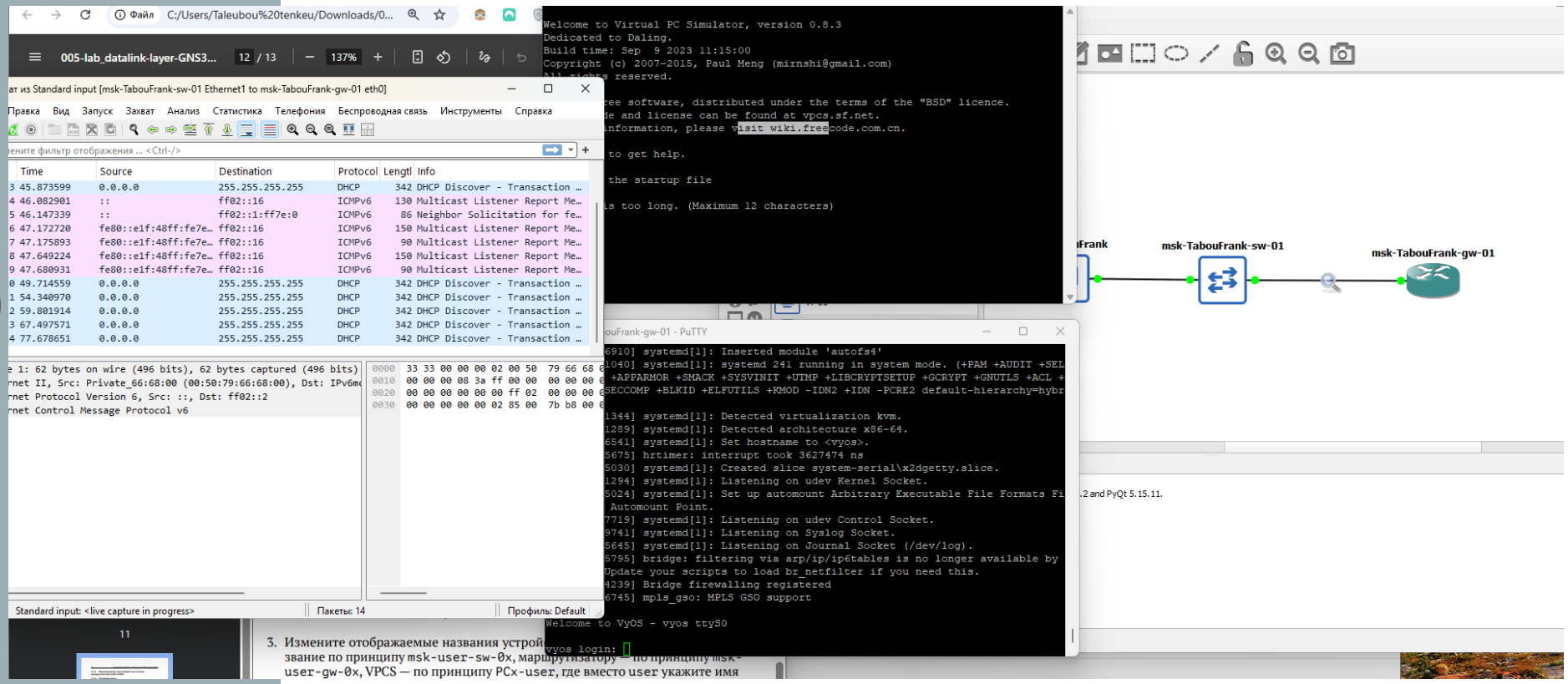

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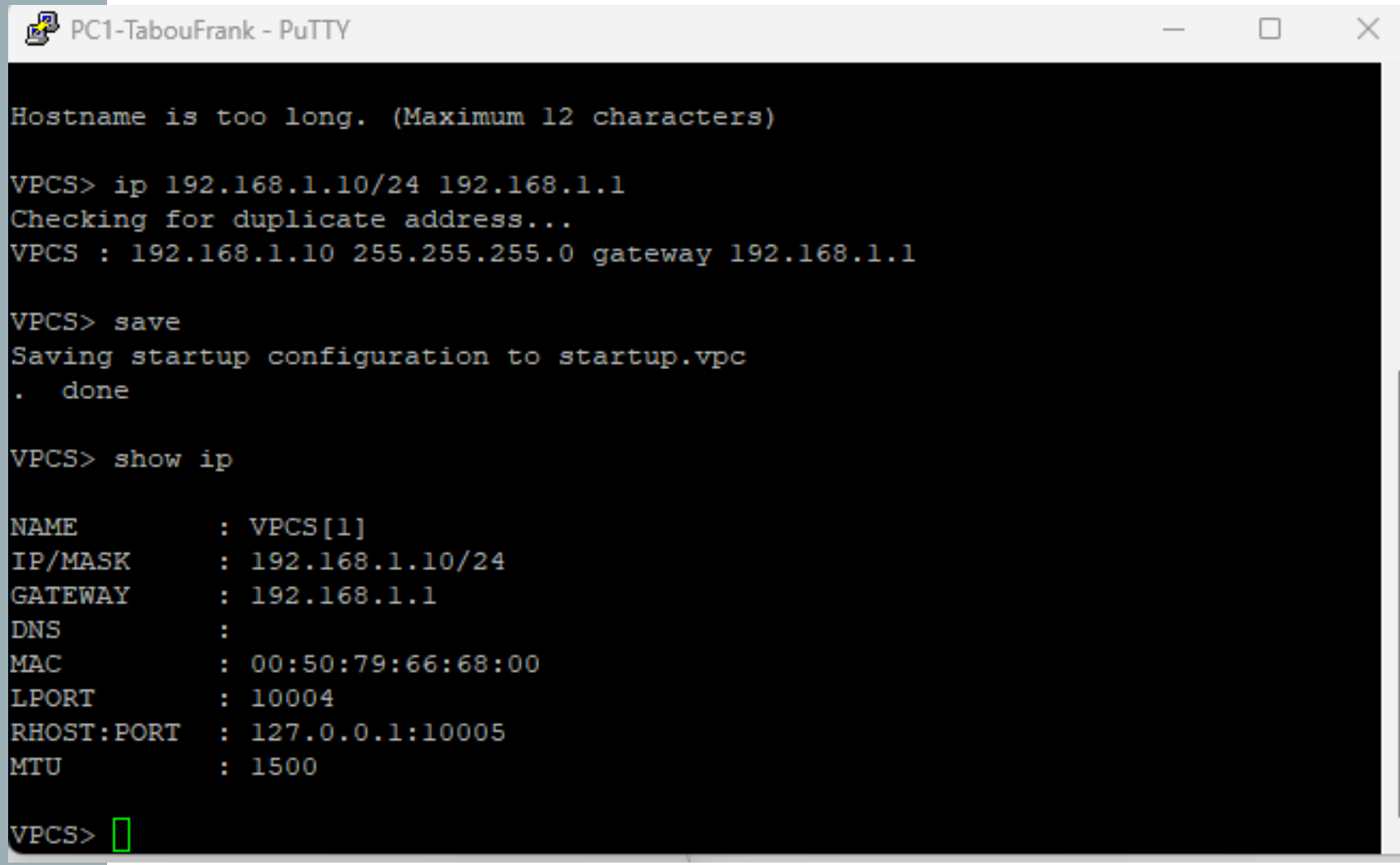

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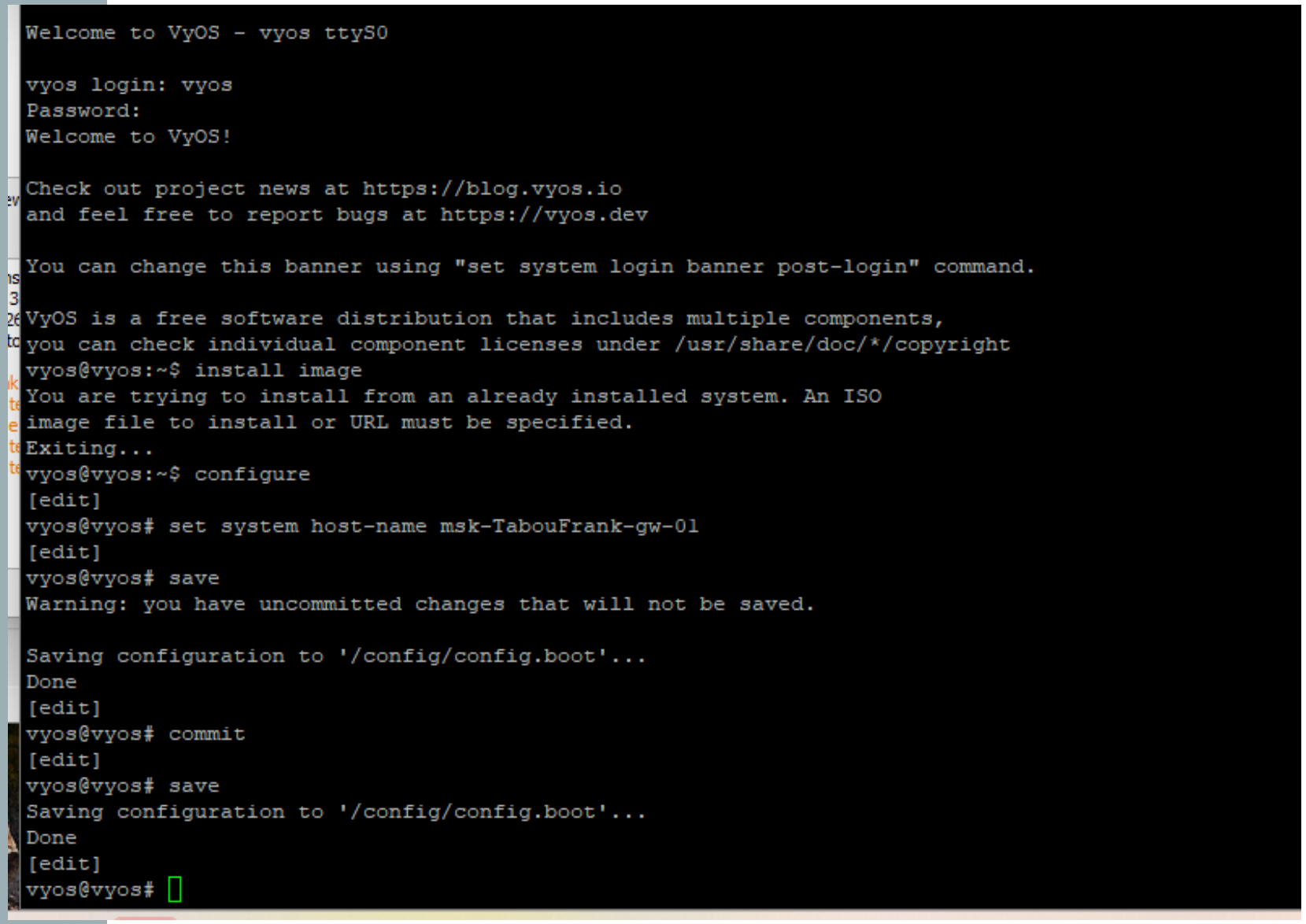

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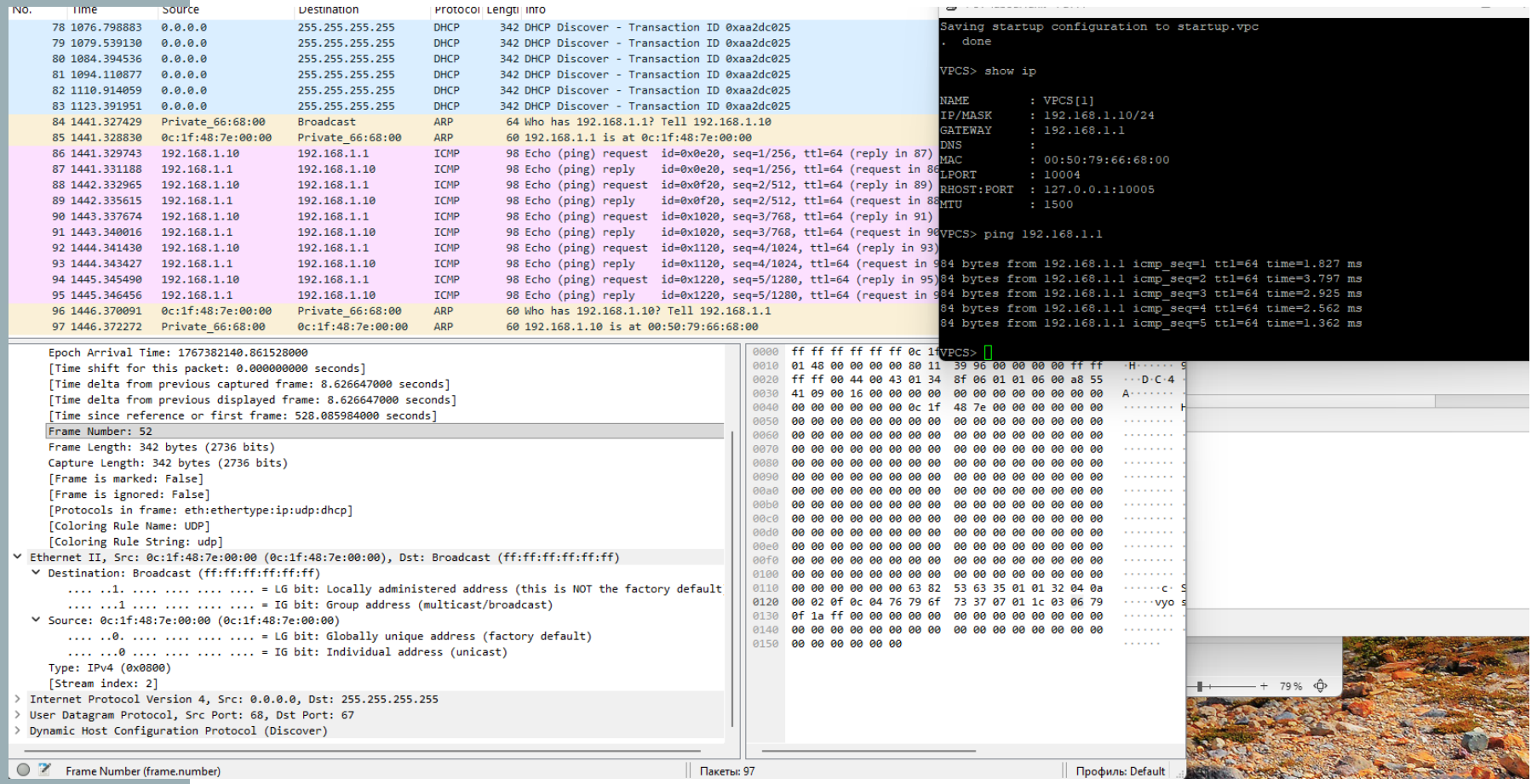

ВЫВОДЫ

В процессе выполнения данной лабораторной работы я построил простейшие модели сети на базе коммутатора и маршрутизатора VyOS в GNS3, проанализировал трафик посредством Wireshark.