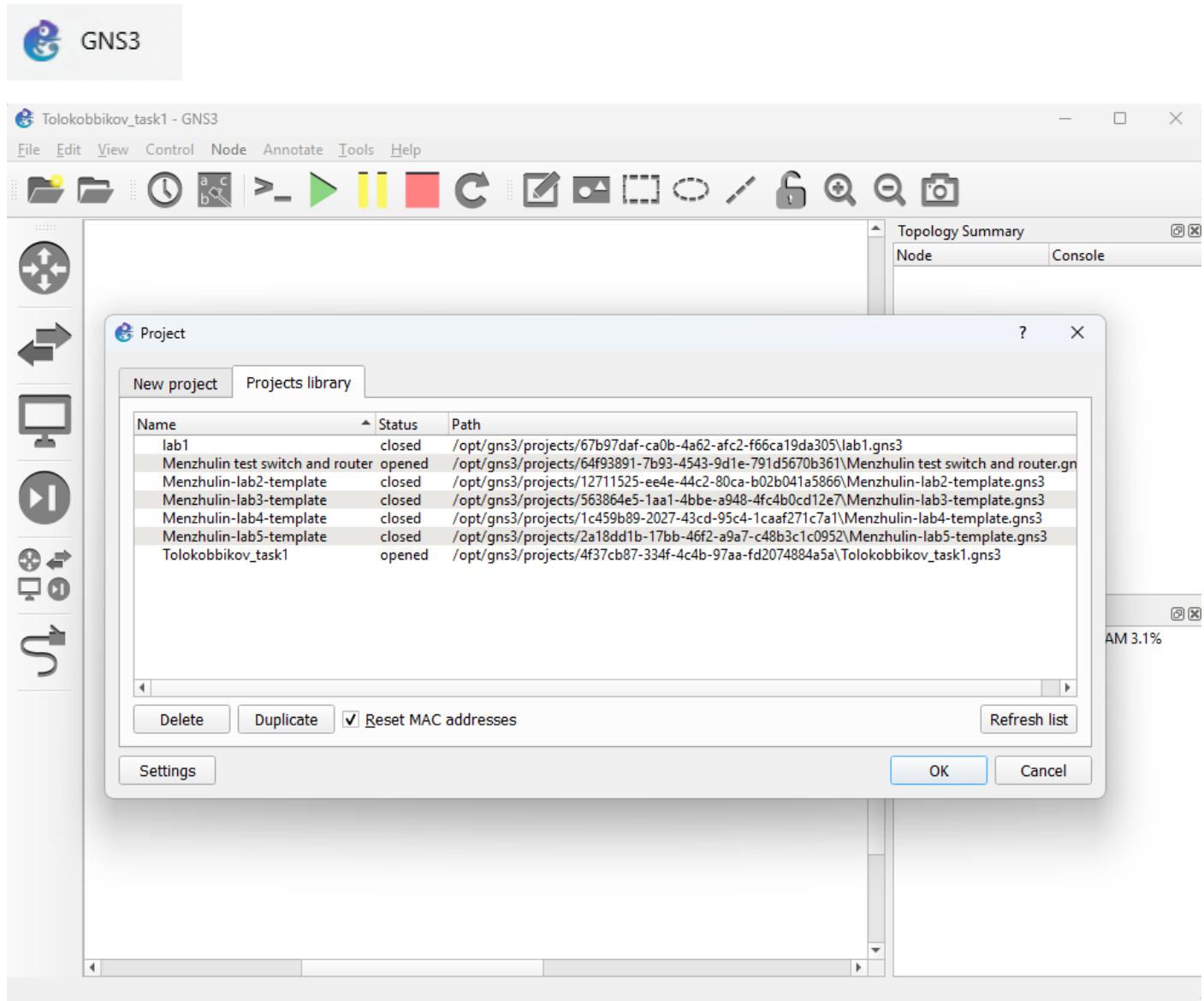
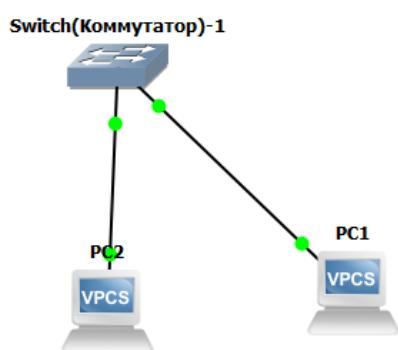


1) Установить и настроить эмулятор GNS3



2) Создать простейшую сеть, состоящую из 1 коммутатора и 2 компьютеров, назначить им произвольные ip адреса из одной сети

Ставим коммутатор, 2 VPCS, подключаем их между собой по Ethernet.



Жмём зелёную кнопку, начинаем симуляцию.

Присваиваем IP. Я перепутал компьютеры местами, поэтому получилось так:

PC1 – 192.168.1.2

PC2 – 192.168.1.1

Маска – 255.255.255.0

```
PC2 - PuTTY
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.1.1 255.255.255.0
Checking for duplicate address...
PC2 : 192.168.1.1 255.255.255.0
PC2> [green square]

PC1 - PuTTY
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC1> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0
PC1> [green square]
```

Причём я забыл маску вписать второму, так что по новой.

```
PC2 - PuTTY
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.1.1 255.255.255.0
Checking for duplicate address...
PC2 : 192.168.1.1 255.255.255.0
PC2> show ip

NAME      : PC2[1]
IP/MASK   : 192.168.1.1/24
GATEWAY   : 255.255.255.0
DNS       :
MAC       : 00:50:79:66:68:01
LPORT     : 20006
RHOST:PORT: 127.0.0.1:20007
MTU       : 1500
PC2> [green square]

PC1 - PuTTY
IP/MASK      : 192.168.1.2/24
GATEWAY     : 0.0.0.0 !
DNS         :
MAC         : 00:50:79:66:68:00
LPORT       : 20004
RHOST:PORT : 127.0.0.1:20005
MTU         : 1500

PC1> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0
PC1> show ip

NAME      : PC1[1]
IP/MASK   : 192.168.1.2/24
GATEWAY   : 255.255.255.0
DNS       :
MAC       : 00:50:79:66:68:00
LPORT     : 20004
RHOST:PORT: 127.0.0.1:20005
MTU       : 1500
PC1> [green square]
```

3) Запустить симуляцию, выполнить команду ping с одного из компьютеров, используя ip адрес второго компьютера

```
PC1 - PuTTY
PC1> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0

PC1> show ip

NAME      : PC1[1]
IP/MASK   : 192.168.1.2/24
GATEWAY   : 255.255.255.0
DNS       :
MAC       : 00:50:79:66:68:00
LPORT     : 20004
RHOST:PORT: 127.0.0.1:20005
MTU       : 1500

PC1> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=8.472 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=0.551 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=0.612 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=0.617 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=2.876 ms

PC1> [green square]
```

С первого компьютера с ip 192.168.1.2 пинганули второй с ip 192.168.1.1

4) Перехватить трафик протокола arp на всех линках(nb!), задокументировать и проанализировать заголовки пакетов в программе Wireshark, для фильтрации трафика, относящегося к указанному протоколу использовать фильтры Wireshark

ПКМ на линк, “start capture”, смотрим на пакеты

The left window shows a standard capture with the title "Захват с Standard input [PC1 Ethernet0 to Switch(Коммутатор)-1 Ethernet0]". The right window shows a filtered capture with the title "Захват с Standard input [PC1 Ethernet0 to Switch(Коммутатор)-1 Ethernet1]". Both windows have the same menu bar and toolbars. The left window has a status bar at the bottom with "Пакеты: 36" and "Профиль: Default". The right window also has a status bar with "Пакеты: 33" and "Профиль: Default". The captured frames are listed in both windows, showing details like source and destination MAC addresses, protocols, and payloads.

Применим фильтр arp

This screenshot shows the same Wireshark interface as above, but with the arp filter applied. The title bar now reads "Захват с Standard input [PC1 Ethernet0 to Switch(Коммутатор)-1 Ethernet0]". The status bar at the bottom shows "Профиль: Default". The packet list shows only ARP frames, which are highlighted in yellow. The packet details and bytes panes below the list pane show the structure of the captured ARP frames.

This screenshot shows the same Wireshark interface as the previous one, but with the arp filter applied to the second interface. The title bar now reads "Захват с Standard input [PC1 Ethernet0 to Switch(Коммутатор)-1 Ethernet1]". The status bar at the bottom shows "Профиль: Default". The packet list shows only ARP frames, which are highlighted in yellow. The packet details and bytes panes below the list pane show the structure of the captured ARP frames.

Снова делаем ping

```
PC1> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=0.409 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=0.521 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=1.533 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=3.191 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=7.726 ms
```

The figure shows two instances of the Wireshark network traffic analyzer. The top instance is titled "Захват с Standard input [PC2 Ethernet0 to Switch(Коммутатор)-1 Ethernet0]" and the bottom instance is titled "Захват с Standard input [PC1 Ethernet0 to Switch(Коммутатор)-1 Ethernet1]". Both instances show the same sequence of ARP requests and responses.

**ARP Request (Frame 347):**

- Source: Private\_66:68:00
- Destination: Broadcast
- Protocol: ARP
- Length: 64 bytes
- Info: Who has 192.168.1.1? Tell 192.168.1.2

**ARP Response (Frame 348):**

- Source: Private\_66:68:01
- Destination: Broadcast
- Protocol: ARP
- Length: 64 bytes
- Info: 192.168.1.1 is at 00:50:79:66:68:01

**Packets List View:**

No.	Time	Source	Destination	Protocol	Length	Info
347	503.729743	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.1? Tell 192.168.1.2
348	503.729816	Private_66:68:01	Private_66:68:00	ARP	64	192.168.1.1 is at 00:50:79:66:68:01

**Hex View (Selected Frame 348):**

```

0000 ff ff ff ff ff ff 00 50 79 66 68 00 08 06 00 01 .....P yfh.....
0010 08 00 06 04 00 01 00 50 79 66 68 00 c0 a8 01 02 .....P yfh.....
0020 ff ff ff ff ff c0 a8 01 00 00 00 00 00 00 00 00 00 .....P yfh.....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....P yfh.....

```

**Bottom Window Summary:**

- Address Resolution Protocol: Protocol
- Пакеты: 426 · Отображено: 2 (0.5%)
- Профили: Default

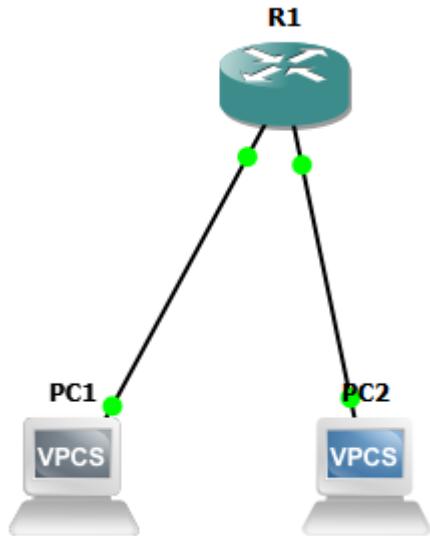
Теперь анализируем пакеты arp после ping:

На каждом линке два пакета. Первый - broadcast, то есть для всех. В инфо сказано "Who has 192.168.1.1"? Tell 192.168.1.2. Что прямым текстом говорит, что мы по всей сети ищем обладателя такого ip и просим нам ответить назад, оставив свой ip.

Так как 192.168.1.1 есть в сети, то он пакет получил и отправил уже приватный ответ для 192.168.1.2, не зачем бродкастом опять кричать. В ответ причём он сообщил свой MAC адрес. Мол «Я тут».

Заголовки рассмотрим, проанализируем и сравним в конце отчёта, чтобы было, что сравнивать

5) Создать простейшую сеть, состоящую из 1 маршрутизатора и 2 компьютеров, назначить им произвольные ip адреса из разных сетей



Настроим маршрутизатор

```
R1#configure
Configuring from terminal, memory, or network [terminal]? terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#des
*Mar 1 00:04:01.967: %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
*Mar 1 00:04:02.967: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
R1(config-if)#description "To PC1"
R1(config-if)#exit
R1(config)#interface FastEthernet1/0
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#
*Mar 1 00:05:08.247: %LINK-3-UPDOWN: Interface FastEthernet1/0, changed state to up
*Mar 1 00:05:09.247: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
R1(config-if)#description "To PC2"
R1(config-if)#exit
R1(config)#exit
R1#
*Mar 1 00:05:55.131: %SYS-5-CONFIG_I: Configured from console by console
R1#show ip
% Incomplete command.

R1#show ip interface brief
Interface          IP-Address      OK? Method Status        Protocol
FastEthernet0/0    192.168.1.1    YES manual up           up
FastEthernet1/0    192.168.2.1    YES manual up           up
Ethernet2/0        unassigned     YES unset  administratively down down
Ethernet2/1        unassigned     YES unset  administratively down down
Ethernet2/2        unassigned     YES unset  administratively down down
Ethernet2/3        unassigned     YES unset  administratively down down
Serial3/0          unassigned     YES unset  administratively down down
Serial3/1          unassigned     YES unset  administratively down down
Serial3/2          unassigned     YES unset  administratively down down
Serial3/3          unassigned     YES unset  administratively down down
R1#
```

Ещё запишем конфигурацию

```
R1#write memory
Building configuration...
[OK]
R1#
```

На всякий

## Теперь настроим компьютеры

```
PC1 - PuTTY
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC1> ip 192.168.1.1 255.255.255.0
Checking for duplicate address...
192.168.1.1 is being used by MAC cc:01:0e:5e:00:00
Address not changed

PC1> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0

PC1>
```

```
PC2 - PuTTY
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
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Press '?' to get help.

Executing the startup file

PC2> ip 192.168.2.2 255.255.255.0
Checking for duplicate address...
PC2 : 192.168.2.2 255.255.255.0

PC2>
```

PC1 теперь с логичным ему ip – 192.168.1.2

PC2 – 192.168.2.2

```
PC1 : 192.168.1.2 255.255.255.0

PC1> ping 192.168.2.2

host (255.255.255.0) not reachable

PC1> PC1 : 192.168.1.2 255.255.255.0
Bad command: "PC1 : 192.168.1.2 255.255.255.0". Use ? for help.

PC1>
```

Оказалось, забыл шлюз указать. Исправляю:

```
PC1 - PuTTY
Executing the startup file

PC1> ip 192.168.1.1 255.255.255.0
Checking for duplicate address...
192.168.1.1 is being used by MAC cc:01:0e:5e:00:00
Address not changed

PC1> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0

PC1> ping 192.168.2.2

host (255.255.255.0) not reachable

PC1> PC1 : 192.168.1.2 255.255.255.0
Bad command: "PC1 : 192.168.1.2 255.255.255.0". Use ? for help.

PC1> ip 192.168.1.2 255.255.255.0 192.168.1.1
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0 gateway 192.168.1.1

PC1>
```

```
PC2 - PuTTY
Welcome to Virtual PC Simulator, version 0.8.3
Dedicated to Daling.
Build time: Sep 9 2023 11:15:00
Copyright (c) 2007-2015, Paul Meng (mirnshi@gmail.com)
All rights reserved.

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Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.2.2 255.255.255.0
Checking for duplicate address...
PC2 : 192.168.2.2 255.255.255.0

PC2> ip 192.168.2.2 255.255.255.0 192.168.2.1
Checking for duplicate address...
PC2 : 192.168.2.2 255.255.255.0 gateway 192.168.2.1

PC2>
```

6) Запустить симуляцию, выполнить команду ping с одного из компьютеров, используя ip адрес второго компьютера

```
PC1> ping 192.168.2.2

192.168.2.2 icmp_seq=1 timeout
84 bytes from 192.168.2.2 icmp_seq=2 ttl=63 time=13.299 ms
84 bytes from 192.168.2.2 icmp_seq=3 ttl=63 time=16.335 ms
84 bytes from 192.168.2.2 icmp_seq=4 ttl=63 time=16.338 ms
84 bytes from 192.168.2.2 icmp_seq=5 ttl=63 time=16.039 ms

PC1> ping 192.168.2.2

84 bytes from 192.168.2.2 icmp_seq=1 ttl=63 time=19.489 ms
84 bytes from 192.168.2.2 icmp_seq=2 ttl=63 time=16.238 ms
84 bytes from 192.168.2.2 icmp_seq=3 ttl=63 time=15.655 ms
84 bytes from 192.168.2.2 icmp_seq=4 ttl=63 time=16.068 ms
84 bytes from 192.168.2.2 icmp_seq=5 ttl=63 time=15.347 ms

PC1> █
```

```
PC2> ping 192.168.1.2

84 bytes from 192.168.1.2 icmp_seq=1 ttl=63 time=10.476 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=63 time=17.236 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=63 time=16.506 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=63 time=16.841 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=63 time=16.921 ms

PC2> █
```

Куда первый подевался, не очень понятно. Но работает теперь

7) Перехватить трафик протокола arp и icmp на всех линках(nb!), задокументировать и проанализировать заголовки пакетов в программе Wireshark, для фильтрации трафика, относящегося к указанному протоколу использовать фильтры Wireshark

```
PC1> ping 192.168.2.2

84 bytes from 192.168.2.2 icmp_seq=1 ttl=63 time=29.769 ms
84 bytes from 192.168.2.2 icmp_seq=2 ttl=63 time=17.100 ms
84 bytes from 192.168.2.2 icmp_seq=3 ttl=63 time=15.973 ms
84 bytes from 192.168.2.2 icmp_seq=4 ttl=63 time=16.700 ms
84 bytes from 192.168.2.2 icmp_seq=5 ttl=63 time=16.690 ms

PC1> █
```

**Top Window (PC1 to PC2):**

Захват с Standard input [PC1 Ethernet0 to R1 FastEthernet0/0]

No.	Time	Source	Destination	Protocol	Length	Info
11	92.747921	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.1? Tell 192.168.1.2
12	92.753776	cc:01:0e:5e:00:00	Private_66:68:00	ARP	60	192.168.1.1 is at cc:01:0e:5e:00:00

```

> Frame 11: Packet, 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface
> Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
> Address Resolution Protocol (request)

```

Frame details and hex dump are visible in the bottom pane.

**Bottom Window (PC2 to PC1):**

Захват с Standard input [PC2 Ethernet0 to R1 FastEthernet1/0]

No.	Time	Source	Destination	Protocol	Length	Info
12	92.753888	Private_66:68:01	Broadcast	ARP	64	Who has 192.168.2.1? Tell 192.168.2.2
13	92.763834	cc:01:0e:5e:00:10	Private_66:68:01	ARP	60	192.168.2.1 is at cc:01:0e:5e:00:10

```

> Frame 13: Packet, 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface
> Ethernet II, Src: cc:01:0e:5e:00:10 (cc:01:0e:5e:00:10), Dst: Private_66:68:01 (00:50:79:66:68:01)
> Address Resolution Protocol (reply)

```

Frame details and hex dump are visible in the bottom pane.

Ну, кстати, не так часто пакетами обмениваются на фоне прошлой структуры

The figure displays three windows of the NetworkMiner tool, each showing a list of captured network packets and their corresponding hex and ASCII representations.

**Top Window:** Standard input [PCI Ethernet0 to R1 FastEthernet0/0].

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	cc:01:0e:5e:00:00	cc:01:0e:5e:00:00	LOOP	60	60 Reply
2	10.425457	cc:01:0e:5e:00:00	cc:01:0e:5e:00:00	LOOP	60	60 Reply
3	14.262991	cc:01:0e:5e:00:00	CDP/VT/P/DTP/PAg&/UDL	CDP	347	Device ID: R1 Port ID: FastEthernet0/0
4	20.817268	cc:01:0e:5e:00:00	cc:01:0e:5e:00:00	LOOP	60	60 Reply

```

> Frame 1: Packet, 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface
> Ethernet II, Src: cc:01:0e:5e:00:00 (cc:01:0e:5e:00:00), Dst: cc:01:0e:5e:00:00 (cc:01:0e:5e:00:00)
> Configuration Test Protocol (loopback)
> Data (40 bytes)

```

**Middle Window:** Standard input <live capture in progress> || Пакеты: 4 || Профиль: Default

**Bottom Window:** Standard input [PC2 Ethernet0 to R1 FastEthernet1/0].

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	cc:01:0e:5e:00:10	cc:01:0e:5e:00:10	LOOP	60	60 Reply
2	10.435556	cc:01:0e:5e:00:10	cc:01:0e:5e:00:10	LOOP	60	60 Reply
3	20.827359	cc:01:0e:5e:00:10	cc:01:0e:5e:00:10	LOOP	60	60 Reply
4	25.710618	cc:01:0e:5e:00:10	CDP/VT/P/DTP/PAg&/UDL	CDP	347	Device ID: R1 Port ID: FastEthernet1/0

```

> Frame 1: Packet, 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface
> Ethernet II, Src: cc:01:0e:5e:00:10 (cc:01:0e:5e:00:10), Dst: cc:01:0e:5e:00:10 (cc:01:0e:5e:00:10)
> Configuration Test Protocol (loopback)
> Data (40 bytes)

```

Захват с Standard input [PC1 Ethernet0 to R1 FastEthernet0/0]						
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка						
arp						
No.	Time	Source	Destination	Protocol	Length	Info
11	92.747921	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.1? Tell 192.168.1.2
12	92.753776	cc:01:0e:5e:00:00	Private_66:68:00	ARP	60	192.168.1.1 is at cc:01:0e:5e:00:00

> Frame 11: Packet, 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface
▼ Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
> Destination: Broadcast (ff:ff:ff:ff:ff:ff)
> Source: Private_66:68:00 (00:50:79:66:68:00)
Type: ARP (0x806)
[Stream index: 2]
Padding: 00000000000000000000000000000000
Frame check sequence: 0x00000000 [unverified]
[FCS Status: Unverified]
> Address Resolution Protocol (request)
Address Resolution Protocol: Protocol

Пакеты: 244 · Отображено: 2 (0.8%) | Профиль: Default

Захват с Standard input [PC2 Ethernet0 to R1 FastEthernet1/0]						
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка						
arp						
No.	Time	Source	Destination	Protocol	Length	Info
12	92.753888	Private_66:68:01	Broadcast	ARP	64	Who has 192.168.2.1? Tell 192.168.2.2
13	92.763834	cc:01:0e:5e:00:10	Private_66:68:01	ARP	60	192.168.2.1 is at cc:01:0e:5e:00:10

Пакеты: 244 · Отображено: 2 (0.8%) | Профиль: Default

> Frame 13: Packet, 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface
▼ Ethernet II, Src: cc:01:0e:5e:00:10 (cc:01:0e:5e:00:10), Dst: Private_66:68:01 (00:50:
▼ Destination: Private_66:68:01 (00:50:79:66:68:01)
... 0. .... .... .... = LG bit: Globally unique address (factory default)
... 0. .... .... .... = IG bit: Individual address (unicast)
▼ Source: cc:01:0e:5e:00:10 (cc:01:0e:5e:00:10)
... 0. .... .... .... = LG bit: Globally unique address (factory default)
... 0. .... .... .... = IG bit: Individual address (unicast)
Type: ARP (0x806)
[Stream index: 2]
> Address Resolution Protocol: Protocol

Пакеты: 244 · Отображено: 2 (0.8%) | Профиль: Default

## Из прошлого сетапа:

Захват с Standard input [PC2 Ethernet0 to Switch(Коммутатор)-1 Ethernet0]						
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка						
arp						
No.	Time	Source	Destination	Protocol	Length	Info
347	503.729743	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.1? Tell 192.168.1.2
348	503.729816	Private_66:68:01	Private_66:68:00	ARP	60	192.168.1.1 is at 00:50:79:66:68:01

Пакеты: 426 · Отображено: 2 (0.5%) | Профиль: Default

> Frame 347: Packet, 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface
▼ Ethernet II, Src: Private_66:68:00 (00:50:79:66:68:00), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
> Destination: Broadcast (ff:ff:ff:ff:ff:ff)
> Source: Private_66:68:00 (00:50:79:66:68:00)
Type: ARP (0x806)
[Stream index: 2]
> Address Resolution Protocol (request)
Address Resolution Protocol: Protocol

Пакеты: 426 · Отображено: 2 (0.5%) | Профиль: Default

Захват с Standard input [PC1 Ethernet0 to Switch(Коммутатор)-1 Ethernet1]						
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка						
arp						
No.	Time	Source	Destination	Protocol	Length	Info
345	499.729885	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.1? Tell 192.168.1.2
346	499.730545	Private_66:68:01	Private_66:68:00	ARP	60	192.168.1.1 is at 00:50:79:66:68:01

Пакеты: 426 · Отображено: 2 (0.5%) | Профиль: Default

> Frame 346: Packet, 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface
▼ Ethernet II, Src: Private_66:68:01 (00:50:79:66:68:01), Dst: Broadcast (ff:ff:ff:ff:ff:ff)
> Destination: Broadcast (ff:ff:ff:ff:ff:ff)
> Source: Private_66:68:01 (00:50:79:66:68:01)
Type: ARP (0x806)
[Stream index: 2]
> Address Resolution Protocol (reply)
Address Resolution Protocol: Protocol

Пакеты: 426 · Отображено: 2 (0.5%) | Профиль: Default

Отличия в заголовках в том, что маршрутизатор при пересылке меняет Source пакета, а коммутатор этого не делает.

С коммутатором:

Пакет шёл с source: private\_66:68:00, через коммутатор так и прошёл, не изменился source.

Ответный пакет шёл с source: private\_66:68:01, так и остался private\_66:68:01

С маршрутизатором:

Пакет шёл с source: private\_66:68:00, через маршрутизатор прошёл и стал source: private\_66:68:01.

Мол, теперь это пакет, высланный маршрутизатором. Поменялся мак адрес отправителя.

И ответ теперь тоже маршрутизатору, destination: cc:01:0e:5e:00:10, но маршрутизатор меняет destination на private\_66:68:00. PC1 успешно получает свой пакет через маршрутизатор.