

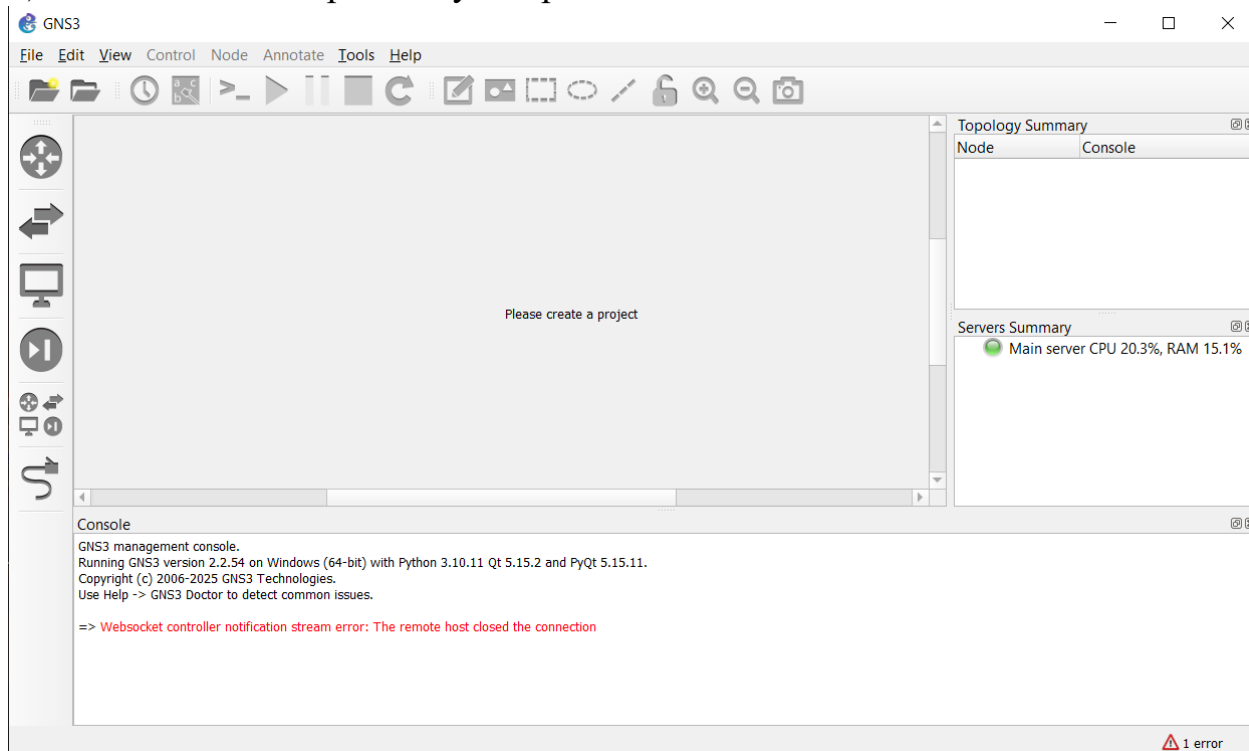
Зотов Дмитрий

Модуль 4

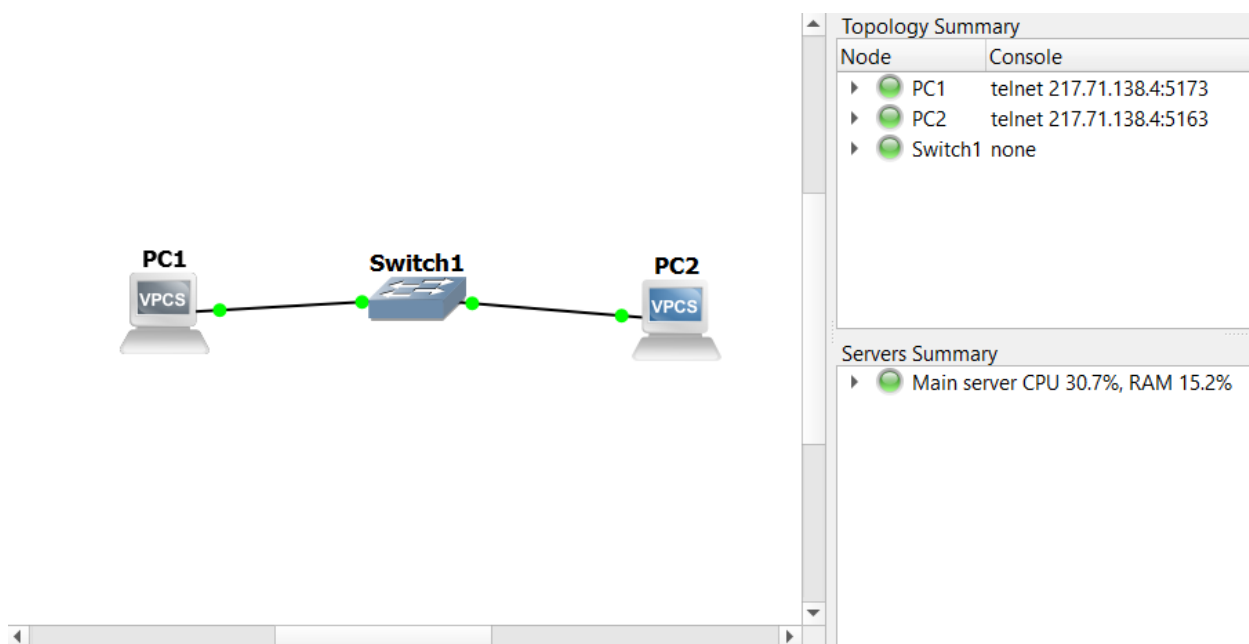
Лабораторная 1

Часть 1

1) Установил и настроил эмулятор GNS3



2) Создал сеть из двух PC и одного Switch



Назначил ip и gateway для PC1:

```
PC1 - PuTTY
address [mask] [gateway]
address [gateway] [mask]
Set the VPC's ip, default gateway ip and network mask
Default IPv4 mask is /24, IPv6 is /64. Example:
ip 10.1.1.70/26 10.1.1.65 set the VPC's ip to 10.1.1.70,
the gateway to 10.1.1.65, the netmask to 255.255.255.192.
In tap mode, the ip of the tapx is the maximum host ID
of the subnet. In the example above the tapx ip would be
10.1.1.126
mask may be written as /26, 26 or 255.255.255.192
auto Attempt to obtain IPv6 address, mask and gateway using SLAAC
dhcp [OPTION] Attempt to obtain IPv4 address, mask, gateway, DNS via DHCP
        -d Show DHCP packet decode
        -r Renew DHCP lease
        -x Release DHCP lease
dns ip Set DNS server ip, delete if ip is '0'
dns6 ipv6 Set DNS server ipv6, delete if ipv6 is '0'
domain NAME Set local domain name to NAME

PC1> ip 192.168.1.1/24 192.168.1.11
Checking for duplicate address...
PC1 :192.168.1.1 255.255.255.0 gateway 192.168.1.11

PC1>
```

Назначил ip и gateway для PC2:

```
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 192.168.1.2/24 198.168.1.12
not same subnet

PC2> ip 192.168.1.2/24 192.168.1.12
Checking for duplicate address...
PC2 : 192.168.1.2 255.255.255.0 gateway 192.168.1.12

PC2>
```

3) Выполнить команду ping с одного из компьютеров, используя ip адрес второго компьютера

```
PC1> ping 192.168.1.2

84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=0.172 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=0.224 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=0.226 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=0.226 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=0.282 ms

PC1>
```

4) Перехватил трафик протокола arp на всех линках.

Захват из Standard input [PC1 Ethernet0 to Switch1 Ethernet0]

Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка

arp

No.	Time	Source	Destination	Protocol	Length	Info
11	25.912092	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.2? Tell 192.168.1.1
12	25.912124	Private_66:68:01	Private_66:68:00	ARP	64	192.168.1.2 is at 00:50:79:66:68:01

> Frame 11: 64 bytes on wire (512 bits), 64 bytes captured (512 bits) on interface -, id 0

> 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)

0000 ff ff ff ff ff ff 00 50 79 66 68 00 08 06 00 01P yrfh....

0010 08 00 06 04 00 01 00 50 79 66 68 00 c0 a8 01 01P yrfh....

0020 ff ff ff ff ff c0 a8 01 02 00 00 00 00 00 00P yrfh....

0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00P yrfh....

Address Resolution Protocol: Protocol

Пакеты: 20 - Отображено: 2 (10.0%)

Профиль: Default

Захват из Standard input [PC2 Ethernet0 to Switch1 Ethernet1]

Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка

arp

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	Private_66:68:00	Broadcast	ARP	64	Who has 192.168.1.2? Tell 192.168.1.1
2	0.000149	Private_66:68:01	Private_66:68:00	ARP	64	192.168.1.2 is at 00:50:79:66:68:01

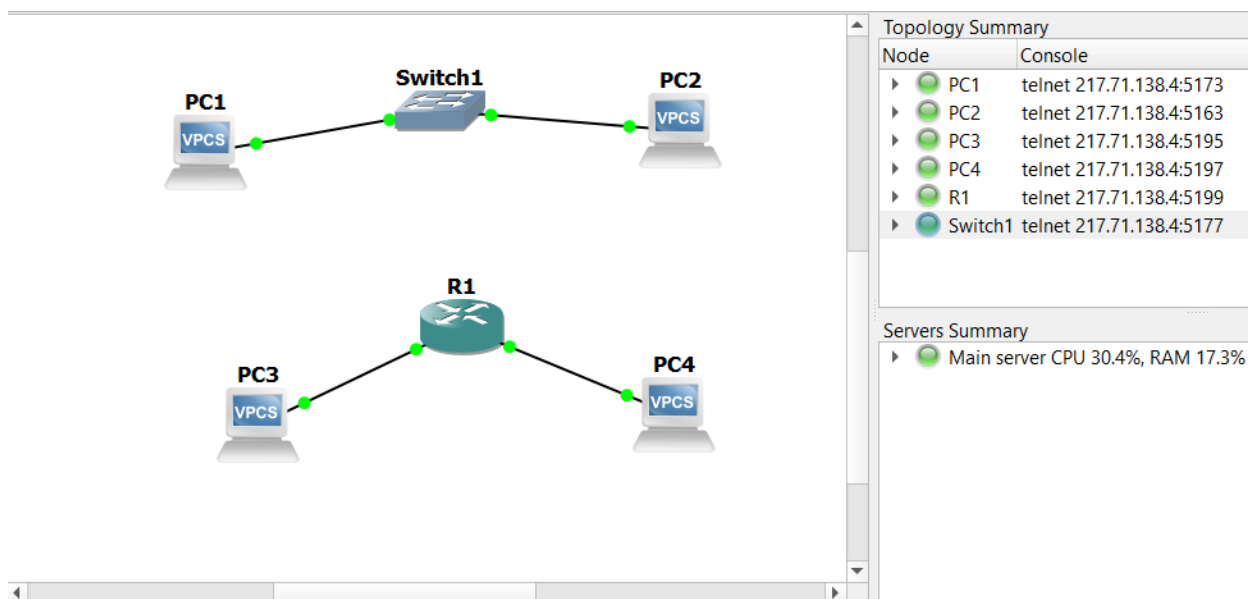
Address Resolution Protocol: Protocol

Пакеты: 12 - Отображено: 2 (16.7%)

Профиль: Default

Часть 2

5) Создал сеть из Router и двух PC



Назначил ip для двух PC:

```
PC3 - 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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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

PC3> ip 190.100.1.1/24
Checking for duplicate address...
PC3 : 190.100.1.1 255.255.255.0

PC3> ip 190.100.1.1/24 190.100.1.11
Checking for duplicate address...
PC3 : 190.100.1.1 255.255.255.0 gateway 190.100.1.11

PC3> 
```

```
PC4 - 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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For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC4> ip 186.168.1.1/24
Checking for duplicate address...
PC4 : 186.168.1.1 255.255.255.0

PC4> ip 186.168.1.1/24 186.168.1.11
Checking for duplicate address...
PC4 : 186.168.1.1 255.255.255.0 gateway 186.168.1.11

PC4> █
```

Назначил ip адреса шлюзов для роутера и поднял их:

```
R1
% Incomplete command.

R1#conf
Configuring from terminal, memory, or network [terminal]? ter
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#interface Fast
R1(config)#interface FastEthernet1/0
R1(config-if)#no shutdown
R1(config-if)#
R1#
*Mar  1 00:11:06.763: %LINK-3-UPDOWN: Interface FastEthernet1/0, changed state t
o up
*Mar  1 00:11:07.763: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthern
et1/0, changed state to up
R1#
*Mar  1 00:11:08.251: %SYS-5-CONFIG_I: Configured from console by console
R1#show ip interface brief
Interface                IP-Address      OK? Method Status      Prot
ocol
FastEthernet0/0          190.100.1.11    YES manual up          up
FastEthernet1/0          186.168.1.11    YES manual up          up

R1# █
```

Выполнил команду ping:

```
PC3 - PuTTY

Executing the startup file

PC3> ip 190.100.1.1/24
Checking for duplicate address...
PC3 : 190.100.1.1 255.255.255.0

PC3> ip 190.100.1.1/24 190.100.1.11
Checking for duplicate address...
PC3 : 190.100.1.1 255.255.255.0 gateway 190.100.1.11

PC3> ping 186.168.1.1

host (190.100.1.11) not reachable

PC3> ping 186.168.1.1

186.168.1.1 icmp_seq=1 timeout
186.168.1.1 icmp_seq=2 timeout
84 bytes from 186.168.1.1 icmp_seq=3 ttl=63 time=14.542 ms
84 bytes from 186.168.1.1 icmp_seq=4 ttl=63 time=14.965 ms
84 bytes from 186.168.1.1 icmp_seq=5 ttl=63 time=15.046 ms

PC3>
```

Перехватил трафик:

Захват из Standard input [PC3 Ethernet0 to R1 FastEthernet0/0]

Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка

arp or icmp

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	Private_66:68:02	Broadcast	ARP	64	Who has 190.100.1.11? Tell 190.100.1.1
2	1.000231	Private_66:68:02	Broadcast	ARP	64	Who has 190.100.1.11? Tell 190.100.1.1
3	2.001014	Private_66:68:02	Broadcast	ARP	64	Who has 190.100.1.11? Tell 190.100.1.1
5	471.873414	cc:01:7e:59:00:00	Broadcast	ARP	60	Gratuitous ARP for 190.100.1.11 (Reply)
6	471.873458	cc:01:7e:59:00:00	Broadcast	ARP	60	Gratuitous ARP for 190.100.1.11 (Reply)
19	562.751975	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x6c9b, seq=1/256, ttl=64 (no response found!)
21	564.752434	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x6c9b, seq=2/512, ttl=64 (no response found!)
22	564.765990	cc:01:7e:59:00:00	Broadcast	ARP	60	Who has 190.100.1.1? Tell 190.100.1.1
23	564.766046	Private_66:68:02	cc:01:7e:59:00:00	ARP	60	190.100.1.1 is at 00:50:79:66:68:02
24	566.752773	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x709b, seq=3/768, ttl=64 (reply in 25)
25	566.767242	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x709b, seq=3/768, ttl=63 (request in 24)
26	567.767656	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x719b, seq=4/1024, ttl=64 (reply in 27)
27	567.782545	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x719b, seq=4/1024, ttl=63 (request in 26)
28	568.783511	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x729b, seq=5/1280, ttl=64 (reply in 29)
29	568.798502	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x729b, seq=5/1280, ttl=63 (request in 28)

Internet Control Message Protocol: Protocol

Пакеты: 34 - Отображено: 15 (44.1%)

Профиль: Default

Захват из Standard input [PC4 Ethernet0 to R1 FastEthernet1/0]

ФайлПравкаВидЗапускЗахватАнализСтатистикаТелефонияБеспроводная связьИнструментыСправка

arp or icmp

No.	Time	Source	Destination	Protocol	Length	Info
2	0.010057	cc:01:7e:59:00:10	Broadcast	ARP	60	Gratuitous ARP for 186.168.1.11 (Reply)
3	0.010076	cc:01:7e:59:00:10	Broadcast	ARP	60	Gratuitous ARP for 186.168.1.11 (Reply)
11	57.764828	cc:01:7e:59:00:10	Broadcast	ARP	60	Who has 186.168.1.1? Tell 186.168.1.11
12	57.764901	Private 66:68:03	cc:01:7e:59:00:10	ARP	60	186.168.1.1 is at 00:50:79:66:68:03
14	59.755734	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x6e9b, seq=2/512, ttl=63 (reply in 15)
15	59.755821	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x6e9b, seq=2/512, ttl=64 (request in 14)
16	61.756988	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x709b, seq=3/768, ttl=63 (reply in 17)
17	61.757064	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x709b, seq=3/768, ttl=64 (request in 16)
18	62.772342	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x719b, seq=4/1024, ttl=63 (reply in 19)
19	62.772455	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x719b, seq=4/1024, ttl=64 (request in 18)
20	63.788252	190.100.1.1	186.168.1.1	ICMP	98	Echo (ping) request id=0x729b, seq=5/1280, ttl=63 (reply in 21)
21	63.788349	186.168.1.1	190.100.1.1	ICMP	98	Echo (ping) reply id=0x729b, seq=5/1280, ttl=64 (request in 20)

> Frame 2: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface -, id 0

> Ethernet II, Src: cc:01:7e:59:00:10 (cc:01:7e:59:00:10), Dst: Broadcast (ff:ff:ff:ff:ff:ff)

> Address Resolution Protocol (reply/gratuitous ARP)

0000ffffffcc017e59001008060001.....~Y....

0010080006040002cc017e590010baa8010b.....~Y....

0020ffffffffffbaa8010b0000000000.....

00300000000000000000000000.....

Internet Control Message Protocol: Protocol

Пакеты: 32 - Отображено: 12 (37.5%)

Профиль: Default