МИНОБРНАУКИ РОССИИ

Федеральное государственное бюджетное образовательное учреждение высшего образования

НИЖЕГОРОДСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ

УНИВЕРСИТЕТ им. Р.Е.АЛЕКСЕЕВА

Институт радиоэлектроники и информационных технологий

Кафедра информатики и систем управления

ОТЧЕТ

по лабораторной работе №1

по дисциплине

Сети и телекоммуникации

РУКОВОДИТЕЛЬ:

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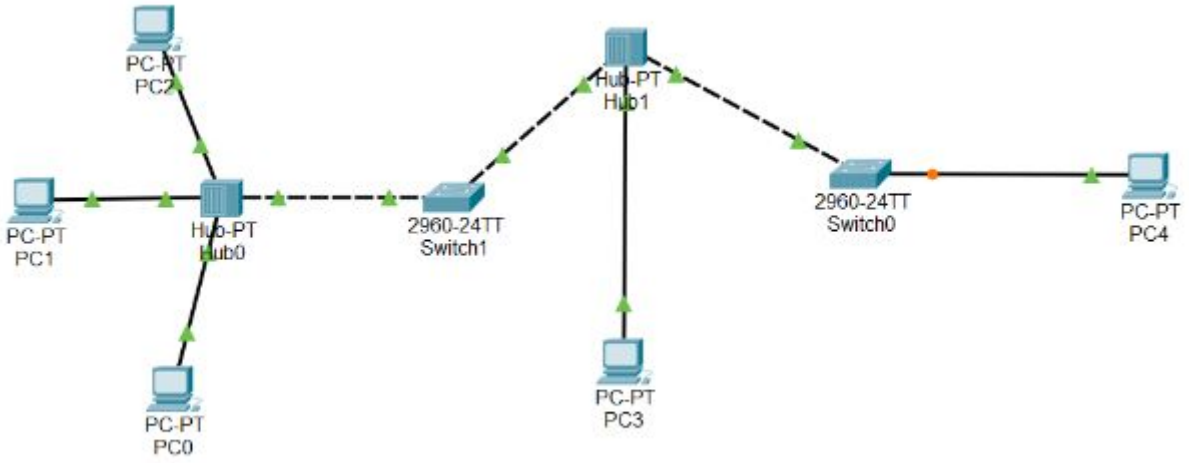
(шифр группы)

Работа защищена «___» _____

С оценкой _____

Нижний Новгород 2020

Вариант 2



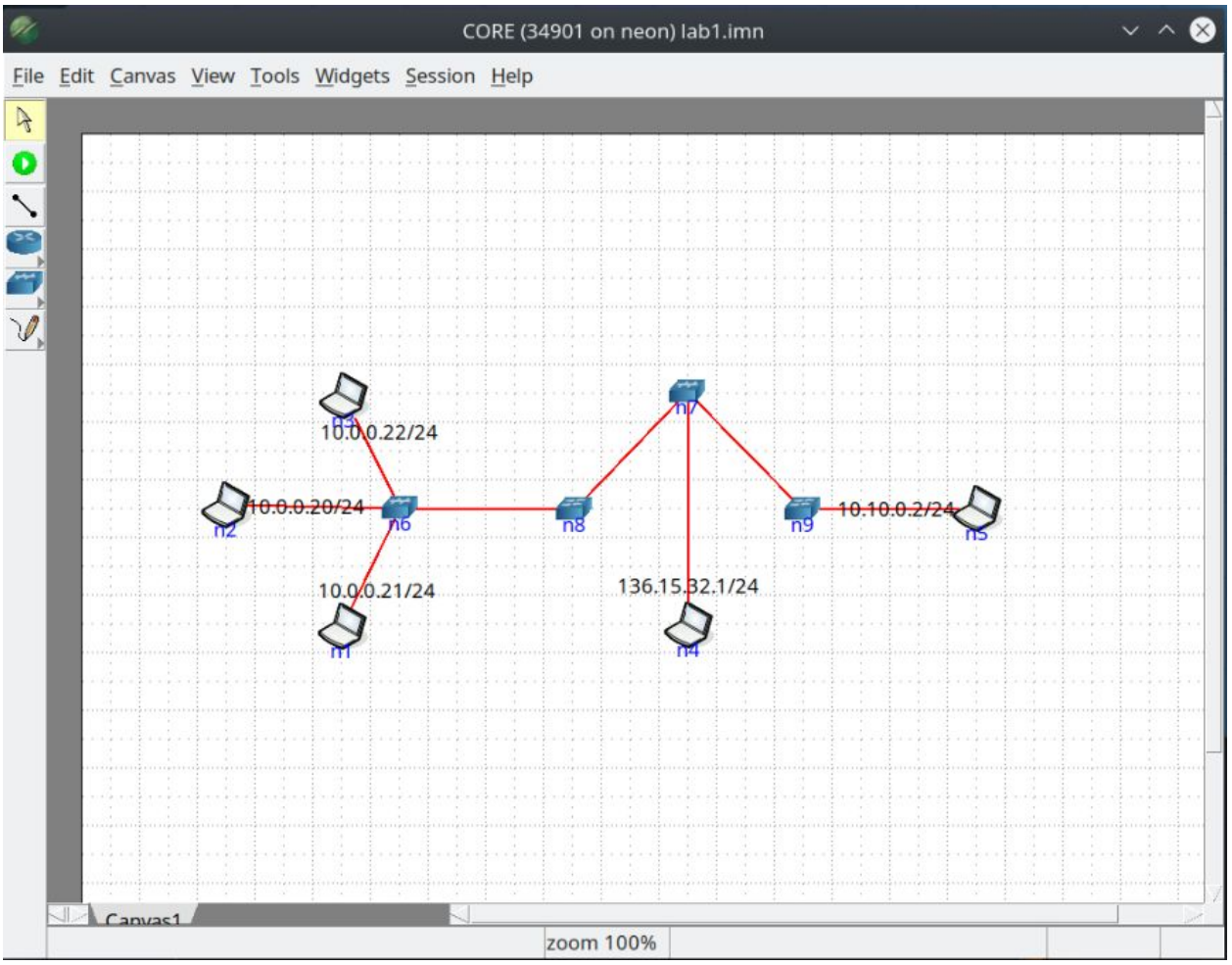
Компьютеры PC0 – PC2 находятся в одной подсети
Компьютер PC3 имеет IP-адрес 136.15.32.1.
Компьютер PC4 имеет IP-адрес 10.10.0.2.

Задание

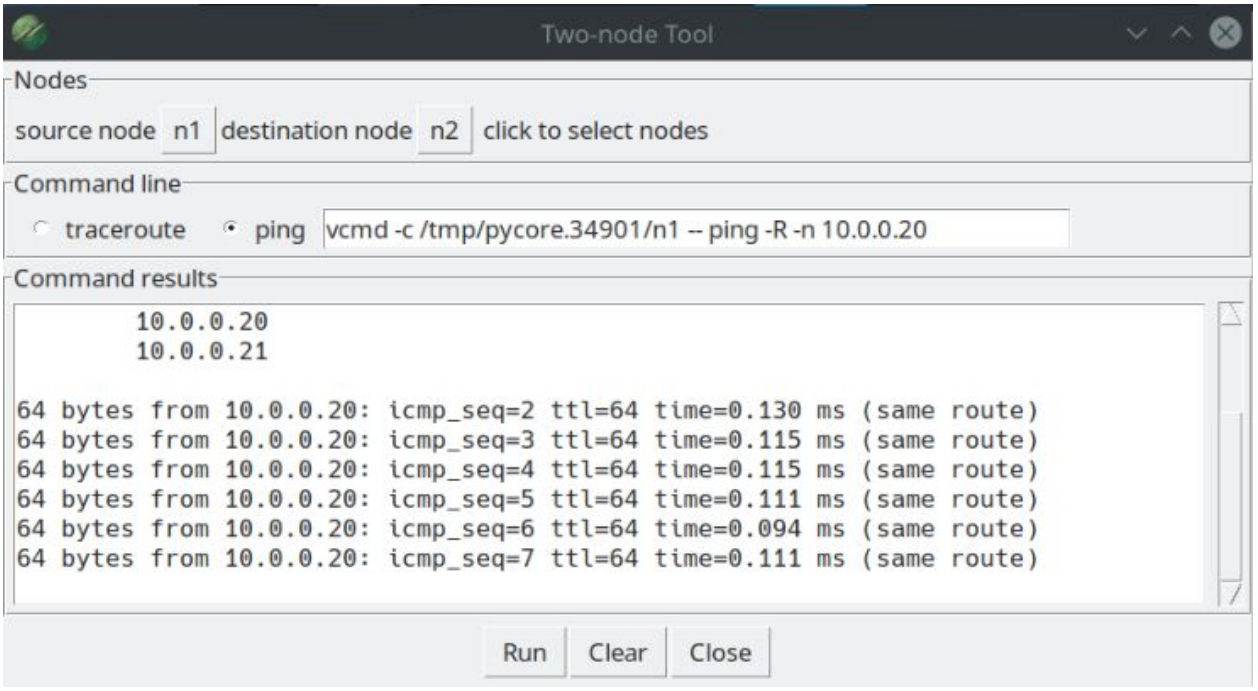
1. Собрать схему
2. Установить для каждого компьютера IP адрес, маску сети
   - удалить ipv6 адреса
   - запись default route – шлюз по умолчанию
3. Между компьютерам одной сети должен проходить ping, между компьютерами из
разных сетей – нет.
4. Запустить wireshark. Выполнить захват пакетов, описать процесс порождения пакетов.
5. Посмотреть виртуальные интерфейсы с помощью ifconfig.

Отчёт: задание на работу, структура сети, доказательства работы, список виртуальных
интерфейсов.

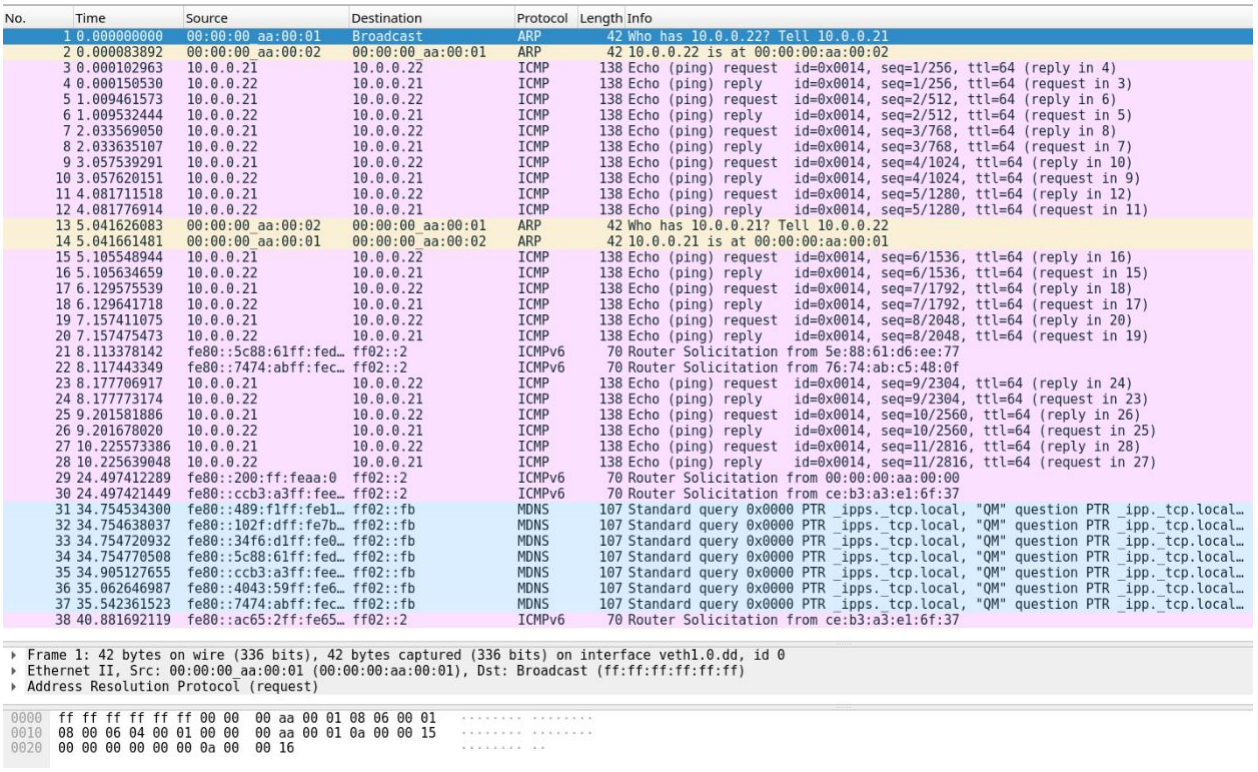
Собранная схема



ping между компьютерами в одной сети

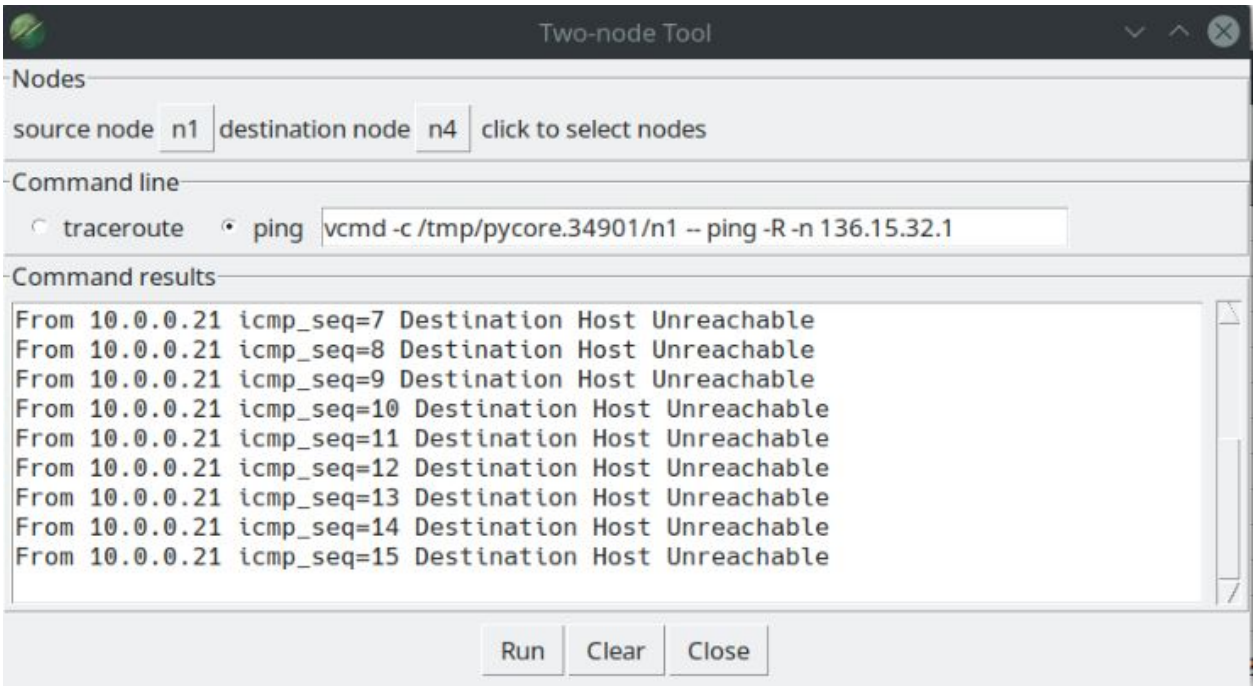


Wireshark



No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.22? Tell 10.0.0.21
2	0.000083892	00:00:00_aa:00:02	00:00:00_aa:00:01	ARP	42	10.0.0.22 is at 00:00:00:aa:00:02
3	0.000102963	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=1/256, ttl=64 (reply in 4)
4	0.000150530	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=1/256, ttl=64 (request in 3)
5	1.009461573	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=2/512, ttl=64 (reply in 6)
6	1.009532444	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=2/512, ttl=64 (request in 5)
7	2.033569050	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=3/768, ttl=64 (reply in 8)
8	2.033635107	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=3/768, ttl=64 (request in 7)
9	3.057539291	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=4/1024, ttl=64 (reply in 10)
10	3.057620151	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=4/1024, ttl=64 (request in 9)
11	4.081711518	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=5/1280, ttl=64 (reply in 12)
12	4.081776914	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=5/1280, ttl=64 (request in 11)
13	5.041626083	00:00:00_aa:00:02	00:00:00_aa:00:01	ARP	42	Who has 10.0.0.21? Tell 10.0.0.22
14	5.041661481	00:00:00_aa:00:01	00:00:00_aa:00:02	ARP	42	10.0.0.21 is at 00:00:00:aa:00:01
15	5.105548944	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=6/1536, ttl=64 (reply in 16)
16	5.105634659	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=6/1536, ttl=64 (request in 15)
17	6.129575539	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=7/1792, ttl=64 (reply in 18)
18	6.129641718	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=7/1792, ttl=64 (request in 17)
19	7.157411075	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=8/2048, ttl=64 (reply in 20)
20	7.157475473	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=8/2048, ttl=64 (request in 19)
21	8.113378142	fe80::5c88:61ff:fed…	ff02::2	ICMPv6	70	Router Solicitation from 5e:88:61:d6:ee:77
22	8.117443349	fe80::7474:abff:fec…	ff02::2	ICMPv6	70	Router Solicitation from 76:74:ab:c5:48:0f
23	8.177706917	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=9/2304, ttl=64 (reply in 24)
24	8.177773174	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=9/2304, ttl=64 (request in 23)
25	9.201581886	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=10/2560, ttl=64 (reply in 26)
26	9.201678020	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=10/2560, ttl=64 (request in 25)
27	10.225573386	10.0.0.21	10.0.0.22	ICMP	138	Echo (ping) request id=0x0014, seq=11/2816, ttl=64 (reply in 28)
28	10.225639048	10.0.0.22	10.0.0.21	ICMP	138	Echo (ping) reply id=0x0014, seq=11/2816, ttl=64 (request in 27)
29	24.497412289	fe80::200:ff:feaa:0	ff02::2	ICMPv6	70	Router Solicitation from 00:00:00:aa:00:00
30	24.497421449	fe80::ccb3:a3ff:fee…	ff02::2	ICMPv6	70	Router Solicitation from ce:b3:a3:e1:6f:37
31	34.754534300	fe80::489:f1ff:feb1…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
32	34.754638037	fe80::102f:dff:fe7b…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
33	34.754720932	fe80::34f6:d1ff:fe0…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
34	34.754770508	fe80::5c88:61ff:fed…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
35	34.905127655	fe80::ccb3:a3ff:fee…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
36	35.062646987	fe80::4043:59ff:fe6…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
37	35.542361523	fe80::7474:abff:fec…	ff02::fb	MDNS	107	Standard query 0x0000 PTR _ipps._tcp.local, "QM" question PTR _ipp._tcp.local…
38	40.881692119	fe80::ac65:2ff:fe65…	ff02::2	ICMPv6	70	Router Solicitation from ce:b3:a3:e1:6f:37

ping между компьютерами из разных сетей



Wireshark

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
2	1.008091677	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
3	2.032004369	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
4	3.056305844	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
5	4.080131239	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
6	5.104015938	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
7	6.128322078	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
8	7.151990057	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
9	8.176086566	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
10	9.200138769	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
11	10.223961184	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
12	11.248013428	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
13	12.272229374	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
14	13.295830813	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
15	14.320013325	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
16	15.344080442	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
17	16.368145925	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
18	17.392083480	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
19	18.416153478	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
20	19.439855568	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
21	20.464082892	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
22	21.488018457	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
23	22.511808889	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
24	23.535873945	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
25	24.560199268	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
26	25.583869032	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
27	26.607870367	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
28	27.632223086	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
29	28.655998544	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
30	29.679811724	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
31	30.704032927	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
32	31.727962938	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21
33	32.751882955	00:00:00_aa:00:01	Broadcast	ARP	42	Who has 10.0.0.1? Tell 10.0.0.21

```
b.6.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::102f:dff:fe7b:b4ad  prefixlen 64  scopeid 0x20<link>
        ether 5e:88:61:d6:ee:77  txqueuelen 1000  (Ethernet)
        RX packets 194  bytes 18439 (18.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 27  bytes 3154 (3.1 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

b.7.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::ac65:2ff:fe65:a588  prefixlen 64  scopeid 0x20<link>
        ether ce:b3:a3:e1:6f:37  txqueuelen 1000  (Ethernet)
        RX packets 193  bytes 18473 (18.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 21  bytes 2512 (2.5 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

b.8.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::489:f1ff:feb1:11a7  prefixlen 64  scopeid 0x20<link>
        ether 42:43:59:6c:08:ef  txqueuelen 1000  (Ethernet)
        RX packets 189  bytes 18083 (18.0 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 28  bytes 3224 (3.2 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

b.9.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::34f6:d1ff:fe04:89f8  prefixlen 64  scopeid 0x20<link>
        ether 76:74:ab:c5:48:0f  txqueuelen 1000  (Ethernet)
        RX packets 184  bytes 17691 (17.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 27  bytes 3154 (3.1 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth1.0.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::5c88:61ff:fed6:ee77  prefixlen 64  scopeid 0x20<link>
        ether 5e:88:61:d6:ee:77  txqueuelen 1000  (Ethernet)
        RX packets 10  bytes 796 (796.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 233  bytes 26212 (26.2 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth2.0.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::6456:44ff:fe66:ccb4  prefixlen 64  scopeid 0x20<link>
        ether 66:56:44:66:cc:b4  txqueuelen 1000  (Ethernet)
        RX packets 10  bytes 796 (796.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 235  bytes 26392 (26.3 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
veth3.0.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::a43c:c4ff:fe0e:d507  prefixlen 64  scopeid 0x20<link>
        ether a6:3c:c4:0e:d5:07  txqueuelen 1000  (Ethernet)
        RX packets 10  bytes 796 (796.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 231  bytes 26036 (26.0 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth4.0.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::d016:99ff:fe85:d4f5  prefixlen 64  scopeid 0x20<link>
        ether d2:16:99:85:d4:f5  txqueuelen 1000  (Ethernet)
        RX packets 10  bytes 796 (796.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 226  bytes 25594 (25.5 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth5.0.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::a469:e9ff:fe33:45f2  prefixlen 64  scopeid 0x20<link>
        ether a6:69:e9:33:45:f2  txqueuelen 1000  (Ethernet)
        RX packets 10  bytes 796 (796.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 216  bytes 24698 (24.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth6.8.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::8c64:bfff:fe9f:3325  prefixlen 64  scopeid 0x20<link>
        ether 8e:64:bf:9f:33:25  txqueuelen 1000  (Ethernet)
        RX packets 164  bytes 18767 (18.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 75  bytes 7889 (7.8 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth7.8.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::ccb3:a3ff:fee1:6f37  prefixlen 64  scopeid 0x20<link>
        ether ce:b3:a3:e1:6f:37  txqueuelen 1000  (Ethernet)
        RX packets 124  bytes 13726 (13.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 114  bytes 12840 (12.8 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth7.9.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::d051:7ff:fee6:bd2c  prefixlen 64  scopeid 0x20<link>
        ether d2:51:07:e6:bd:2c  txqueuelen 1000  (Ethernet)
        RX packets 59  bytes 6653 (6.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 174  bytes 19471 (19.4 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

```
veth8.6.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::4043:59ff:fe6c:8ef  prefixlen 64  scopeid 0x20<link>
        ether 42:43:59:6c:08:ef  txqueuelen 1000  (Ethernet)
        RX packets 75  bytes 7889 (7.8 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 164  bytes 18767 (18.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth8.7.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::ece4:afff:fe0b:7f18  prefixlen 64  scopeid 0x20<link>
        ether ee:e4:af:0b:7f:18  txqueuelen 1000  (Ethernet)
        RX packets 114  bytes 12840 (12.8 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 124  bytes 13726 (13.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

veth9.7.dd: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet6 fe80::7474:abff:fec5:480f  prefixlen 64  scopeid 0x20<link>
        ether 76:74:ab:c5:48:0f  txqueuelen 1000  (Ethernet)
        RX packets 174  bytes 19471 (19.4 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 59  bytes 6653 (6.6 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```