

Зотов Дмитрий

Лабораторная 4

1 - 3) Выполнить планирование и документирование адресного пространства в подсетях LAN1, LAN2, LAN3 и назначить статические адреса маршрутизаторам и динамическое конфигурирование адресов для VPC.

Настроить сервер DHCP на маршрутизаторе R2 для обслуживания адресных пулов адресного пространства подсетей LAN1 и LAN2.

Настроить статическую маршрутизацию между подсетями.

R1:

```
R1(config)#int FastEthernet1/0
R1(config-if)#ip address 192.168.3.1 255.255.255.0
R1(config-if)#no shut
R1(config)#interface FastEthernet0/0
R1(config-if)#ip address 192.168.1.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#interface FastEthernet2/0
R1(config-if)#ip address 192.168.2.1 255.255.255.0
R1(config-if)#no shut
R1(config-if)#exit
R1(config)#ip route 192.168.3.0 255.255.255.0 192.168.3.2
R1(config)#int FastEthernet0/0
R1(config-if)#ip helper-address 192.168.3.2
R1(config-if)#exit
R1(config)#int FastEthernet2/0
R1(config-if)#ip helper-address 192.168.3.2
R1(config-if)#exit
R1(config)#exit
```

R2:

```
R2(config)#int FastEthernet0/0
R2(config-if)#ip address 192.168.3.2 255.255.255.0
R2(config-if)#no shut
R2(config-if)#exit
R2(config)#ip dhcp pool LAN1
R2(dhcp-config)#network 192.168.1.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.1.1
R2(dhcp-config)#dns-server 8.8.8.8
R2(dhcp-config)#exit
R2(config)#ip dhcp pool LAN2
```

```
R2(dhcp-config)#network 192.168.2.0 255.255.255.0
R2(dhcp-config)#default-router 192.168.2.1
R2(dhcp-config)#dns-server 8.8.8.8
R2(dhcp-config)#exit
R2(config)#ip dhcp excluded-address 192.168.1.1 192.168.1.10
R2(config)#ip dhcp excluded-address 192.168.2.1 192.168.2.10
R2(config)#ip route 192.168.1.0 255.255.255.0 192.168.3.1
R2(config)#ip route 192.168.2.0 255.255.255.0 192.168.3.1
R2(config)#exit
```

PC1:

```
PC1> ip dhcp
DDORA IP 192.168.1.11/24 GW 192.168.1.1
```

PC2:

```
PC2> ip dhcp
DDORA IP 192.168.1.12/24 GW 192.168.1.1
```

PC3:

```
PC3> ip dhcp
DDORA IP 192.168.2.11/24 GW 192.168.2.1
```

PC4:

```
PC4> ip dhcp
DDORA IP 192.168.2.12/24 GW 192.168.2.1
```

PC1 пингует PC2-4:

```
PC1> ping 192.168.1.12

84 bytes from 192.168.1.12 icmp_seq=1 ttl=64 time=4.412 ms
84 bytes from 192.168.1.12 icmp_seq=2 ttl=64 time=1.051 ms
84 bytes from 192.168.1.12 icmp_seq=3 ttl=64 time=2.043 ms
84 bytes from 192.168.1.12 icmp_seq=4 ttl=64 time=2.906 ms
84 bytes from 192.168.1.12 icmp_seq=5 ttl=64 time=4.724 ms

PC1> echo PC3
PC3
PC1> ping 192.168.2.11

84 bytes from 192.168.2.11 icmp_seq=1 ttl=63 time=29.330 ms
84 bytes from 192.168.2.11 icmp_seq=2 ttl=63 time=16.494 ms
84 bytes from 192.168.2.11 icmp_seq=3 ttl=63 time=16.016 ms
84 bytes from 192.168.2.11 icmp_seq=4 ttl=63 time=17.245 ms
84 bytes from 192.168.2.11 icmp_seq=5 ttl=63 time=16.867 ms

PC1> ping 192.168.2.12

84 bytes from 192.168.2.12 icmp_seq=1 ttl=63 time=39.755 ms
84 bytes from 192.168.2.12 icmp_seq=2 ttl=63 time=17.305 ms
84 bytes from 192.168.2.12 icmp_seq=3 ttl=63 time=17.195 ms
84 bytes from 192.168.2.12 icmp_seq=4 ttl=63 time=18.494 ms
84 bytes from 192.168.2.12 icmp_seq=5 ttl=63 time=17.919 ms

PC1> █
```

PC2 пингует PC1 & PC3-4:

```
PC2> ping 192.168.1.11

84 bytes from 192.168.1.11 icmp_seq=1 ttl=64 time=0.560 ms
84 bytes from 192.168.1.11 icmp_seq=2 ttl=64 time=8.119 ms
84 bytes from 192.168.1.11 icmp_seq=3 ttl=64 time=0.861 ms
84 bytes from 192.168.1.11 icmp_seq=4 ttl=64 time=4.976 ms
84 bytes from 192.168.1.11 icmp_seq=5 ttl=64 time=5.598 ms

PC2> ping 192.168.2.11

84 bytes from 192.168.2.11 icmp_seq=1 ttl=63 time=30.397 ms
84 bytes from 192.168.2.11 icmp_seq=2 ttl=63 time=11.930 ms
84 bytes from 192.168.2.11 icmp_seq=3 ttl=63 time=16.622 ms
84 bytes from 192.168.2.11 icmp_seq=4 ttl=63 time=19.455 ms
84 bytes from 192.168.2.11 icmp_seq=5 ttl=63 time=16.549 ms

PC2> ping 192.168.2.12

84 bytes from 192.168.2.12 icmp_seq=1 ttl=63 time=26.987 ms
84 bytes from 192.168.2.12 icmp_seq=2 ttl=63 time=17.836 ms
84 bytes from 192.168.2.12 icmp_seq=3 ttl=63 time=16.654 ms
84 bytes from 192.168.2.12 icmp_seq=4 ttl=63 time=16.686 ms
84 bytes from 192.168.2.12 icmp_seq=5 ttl=63 time=17.231 ms

PC2> █
```

PC3 пингует PC1-2 & PC4:

```
PC3> ping 192.168.1.11

84 bytes from 192.168.1.11 icmp_seq=1 ttl=63 time=30.035 ms
84 bytes from 192.168.1.11 icmp_seq=2 ttl=63 time=17.750 ms
84 bytes from 192.168.1.11 icmp_seq=3 ttl=63 time=11.875 ms
84 bytes from 192.168.1.11 icmp_seq=4 ttl=63 time=27.345 ms
84 bytes from 192.168.1.11 icmp_seq=5 ttl=63 time=16.109 ms

PC3> ping 192.168.1.12

84 bytes from 192.168.1.12 icmp_seq=1 ttl=63 time=22.512 ms
84 bytes from 192.168.1.12 icmp_seq=2 ttl=63 time=17.704 ms
84 bytes from 192.168.1.12 icmp_seq=3 ttl=63 time=13.673 ms
84 bytes from 192.168.1.12 icmp_seq=4 ttl=63 time=17.139 ms
84 bytes from 192.168.1.12 icmp_seq=5 ttl=63 time=29.571 ms

PC3> ping 192.168.2.12

84 bytes from 192.168.2.12 icmp_seq=1 ttl=64 time=8.889 ms
84 bytes from 192.168.2.12 icmp_seq=2 ttl=64 time=0.756 ms
84 bytes from 192.168.2.12 icmp_seq=3 ttl=64 time=0.896 ms
84 bytes from 192.168.2.12 icmp_seq=4 ttl=64 time=6.396 ms
84 bytes from 192.168.2.12 icmp_seq=5 ttl=64 time=0.594 ms

PC3> █
```

PC4 пингует PC1-3:

```
PC4> ping 192.168.1.11

84 bytes from 192.168.1.11 icmp_seq=1 ttl=63 time=19.537 ms
84 bytes from 192.168.1.11 icmp_seq=2 ttl=63 time=16.972 ms
84 bytes from 192.168.1.11 icmp_seq=3 ttl=63 time=16.676 ms
84 bytes from 192.168.1.11 icmp_seq=4 ttl=63 time=16.862 ms
84 bytes from 192.168.1.11 icmp_seq=5 ttl=63 time=17.672 ms

PC4> ping 192.168.1.12

84 bytes from 192.168.1.12 icmp_seq=1 ttl=63 time=15.102 ms
84 bytes from 192.168.1.12 icmp_seq=2 ttl=63 time=18.245 ms
84 bytes from 192.168.1.12 icmp_seq=3 ttl=63 time=18.122 ms
84 bytes from 192.168.1.12 icmp_seq=4 ttl=63 time=17.253 ms
84 bytes from 192.168.1.12 icmp_seq=5 ttl=63 time=18.090 ms

PC4> ping 192.168.2.11

84 bytes from 192.168.2.11 icmp_seq=1 ttl=64 time=14.367 ms
84 bytes from 192.168.2.11 icmp_seq=2 ttl=64 time=3.469 ms
84 bytes from 192.168.2.11 icmp_seq=3 ttl=64 time=6.085 ms
84 bytes from 192.168.2.11 icmp_seq=4 ttl=64 time=5.558 ms
84 bytes from 192.168.2.11 icmp_seq=5 ttl=64 time=3.687 ms

PC4> █
```

PING R2:

Захват из Standard input (R1 FastEthernet1/0 to R2 FastEthernet0/0)

ФайлПравкаВидЗапускАнализСтатистикаТелефонияБеспроводная связьИнструментыСправка

Примените фильтр отображения ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
6	24.599781	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
7	28.626375	cc:02:56:67:00:00	CDP/VTP/DTP/PagP/UD...	CDP	338	Device ID: R2 Port ID: FastEthernet0/0
8	30.659785	cc:01:56:49:00:10	cc:01:56:49:00:10	LOOP	60	Reply
9	31.596417	cc:01:56:49:00:10	CDP/VTP/DTP/PagP/UD...	CDP	352	Device ID: R1 Port ID: FastEthernet1/0
10	34.795847	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
11	40.911207	cc:01:56:49:00:10	cc:01:56:49:00:10	LOOP	60	Reply
12	45.307774	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
13	51.162808	cc:01:56:49:00:10	cc:01:56:49:00:10	LOOP	60	Reply
14	55.790243	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
15	61.405170	cc:01:56:49:00:10	cc:01:56:49:00:10	LOOP	60	Reply
16	66.296366	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
17	71.629348	cc:01:56:49:00:10	cc:01:56:49:00:10	LOOP	60	Reply
18	71.790815	192.168.1.11	192.168.3.2	ICMP	98	Echo (ping) request id=0xa273, seq=1/256, ttl=63 (reply in 19)
19	71.802171	192.168.3.2	192.168.1.11	ICMP	98	Echo (ping) reply id=0xa273, seq=1/256, ttl=255 (request in 18)
20	72.820298	192.168.1.11	192.168.3.2	ICMP	98	Echo (ping) request id=0xa373, seq=2/512, ttl=63 (reply in 21)
21	72.830375	192.168.3.2	192.168.1.11	ICMP	98	Echo (ping) reply id=0xa373, seq=2/512, ttl=255 (request in 20)
22	73.847366	192.168.1.11	192.168.3.2	ICMP	98	Echo (ping) request id=0xa473, seq=3/768, ttl=63 (reply in 23)
23	73.848051	192.168.3.2	192.168.1.11	ICMP	98	Echo (ping) reply id=0xa473, seq=3/768, ttl=255 (request in 22)
24	74.865067	192.168.1.11	192.168.3.2	ICMP	98	Echo (ping) request id=0xa573, seq=4/1024, ttl=63 (reply in 25)
25	74.875663	192.168.3.2	192.168.1.11	ICMP	98	Echo (ping) reply id=0xa573, seq=4/1024, ttl=255 (request in 24)
26	75.892440	192.168.1.11	192.168.3.2	ICMP	98	Echo (ping) request id=0xa673, seq=5/1280, ttl=63 (reply in 27)
27	75.893657	192.168.3.2	192.168.1.11	ICMP	98	Echo (ping) reply id=0xa673, seq=5/1280, ttl=255 (request in 26)
28	76.478156	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
29	81.449575	cc:01:56:49:00:10	cc:01:56:49:00:10	LOOP	60	Reply
30	86.994261	cc:02:56:67:00:00	cc:02:56:67:00:00	LOOP	60	Reply
31	91.217133	cc:02:56:67:00:00	CDP/VTP/DTP/PagP/UD...	CDP	338	Device ID: R2 Port ID: FastEthernet0/0

Frame 18: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface -, id 0

Section number: 1

> Interface id: 0 (-)

Encapsulation type: Ethernet (1)

Arrival Time: May 20, 2025 19:20:50.255244000 Новосибирское стандартное время

UTC Arrival Time: May 20, 2025 12:20:50.255244000 UTC

Epoch Arrival Time: 1747743650.255244000

[Time shift for this packet: 0.000000000 seconds]

[Time delta from previous captured frame: 0.161467000 seconds]

[Time delta from previous displayed frame: 0.161467000 seconds]

[Time since reference or first frame: 71.790815000 seconds]

0000 cc 02 56 67 00 00 cc 01 56 49 00 10 00 00 45 00 VI...E

0010 00 54 73 a2 00 00 3f 01 82 a9 c0 a8 01 0b c0 a8 Ts...?

0020 03 02 00 00 7d 97 a2 73 00 01 08 09 0a 0b 0c 0d ...}...s

0030 0e 0f 10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1ds

0040 1e 1f 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d ..!"#\$%&'()*+,-

0050 2e 2f 30 31 32 33 34 35 36 37 38 39 3a 3b 3c 3d ./012345 6789;<=

0060 3e 3f >?

Standard input: <live capture in progress> | Пакеты: 218 | Профиль: Default

Seq=1/256 – порядковый номер ICMP запроса, 1 – порядковый номер, 256 – максимум запросов
ttl = 63 – это time to live время жизни пакета