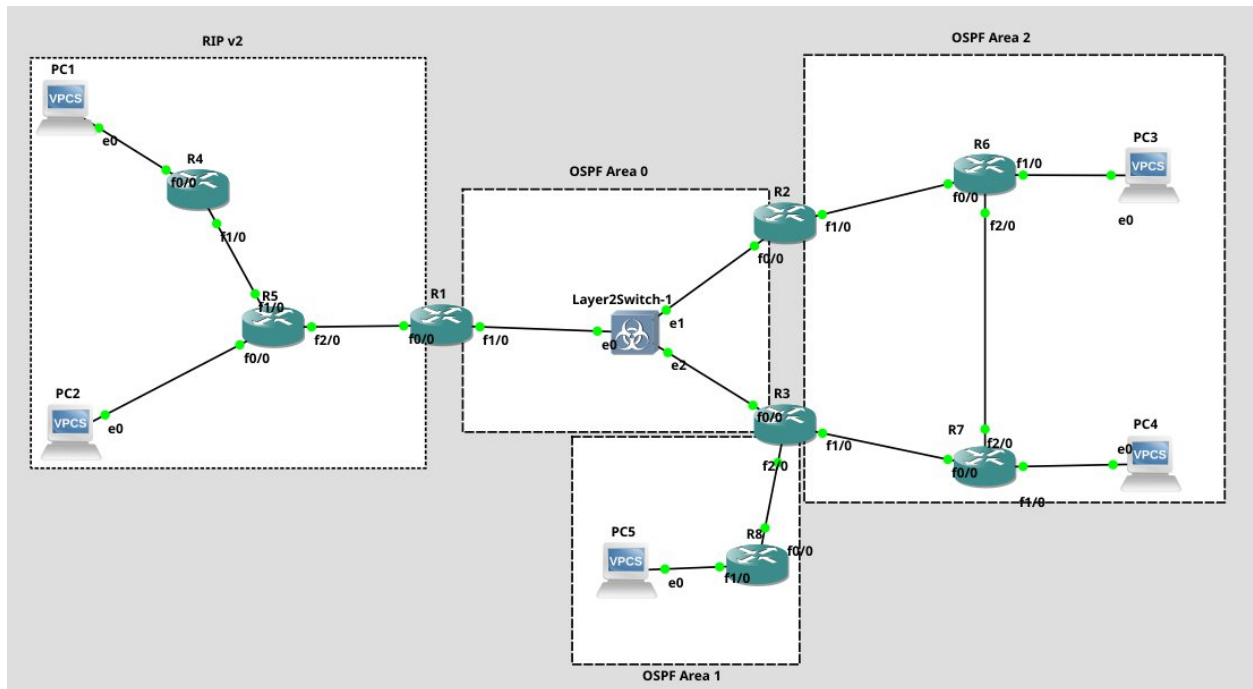


Лабораторная работа №5

Пункт 1



Определим сети (каждое соединение маршрутизатора с маршрутизатором – отдельная сеть):

PC1 – R4: 192.168.1.0/24

PC2 – R5: 192.168.2.0/24

PC3 – R6: 192.168.3.0/24

PC4 – R7: 192.168.4.0/24

PC5 – R8: 192.168.5.0/24

R4 – R5: 10.10.1.0/24

R5 – R1: 10.10.2.0/24

R3 – R8: 10.10.3.0/24

R3 – R7: 10.10.4.0/24

R7 – R6: 10.10.5.0/24

R6 – R2: 10.10.6.0/24

R1 – R2 – R3: 10.10.10.0/24

Назначим адреса каждому устройству:

(PC1)

ip 192.168.1.1 /24 192.168.1.2

(R4)

Enable

Configure

interface FastEthernet 0/0

ip address 192.168.1.2 255.255.255.0

no shutdown

end

Остальные устройства настраиваются аналогичным образом

Пункт 2

Настроим протокол динамической маршрутизации RIP v2 для области (PC1, PC2, R4, R5, R1):

(R1)

configure terminal

router rip

version 2

no auto-summary

network 10.10.2.0

network 10.10.10.0

(R5)

configure terminal

router rip

```
version 2  
  
no auto-summary  
  
network 10.10.1.0  
  
network 10.10.2.0  
  
network 192.168.2.0
```

(R4)

```
configure terminal  
  
router rip  
  
version 2  
  
no auto-summary  
  
network 10.10.1.0  
  
network 192.168.1.0
```

Пункт 3

Настроим протокол динамической маршрутизации OSPF для зон 0, 1, 2. Зону 1 сделаем полностью тупиковую.

(R1)

```
configure terminal  
  
router ospf 1  
  
network 10.10.10.0 0.0.0.255 area 0
```

(R2)

```
configure terminal  
  
router ospf 1  
  
network 10.10.10.0 0.0.0.255 area 0  
  
network 10.10.6.0 0.0.0.255 area 2
```

(R3)

```
configure terminal
router ospf 1
network 10.10.10.0 0.0.0.255 area 0
network 10.10.4.0 0.0.0.255 area 2
network 10.10.3.0 0.0.0.255 area 1
area 1 stub no-summary
```

(R8)

```
configure terminal
router ospf 1
network 192.168.5.0 0.0.0.255 area 1
network 10.10.3.0 0.0.0.255 area 1
area 1 stub no-summary
```

(R7)

```
configure terminal
router ospf 1
network 10.10.4.0 0.0.0.255 area 2
network 192.168.4.0 0.0.0.255 area 2
network 10.10.5.0 0.0.0.255 area 2
```

(R6)

```
configure terminal
router ospf 1
network 10.10.5.0 0.0.0.255 area 2
network 192.168.3.0 0.0.0.255 area 2
network 10.10.6.0 0.0.0.255 area 2
```

Пункт 4

Настроим редистрибуцию маршрутов между протоколами RIP v2 и OSPF.

(R1)

```
configure terminal
```

```
router ospf 1
```

```
redistribute rip subnets metric 15
```

```
router rip
```

```
redistribute ospf 1 metric 10
```

Пункт 5

Проверим работоспособность маршрутизации, выполнив ping VPS «все между всеми» в обе стороны:

```
PC1> ping 192.168.2.1

84 bytes from 192.168.2.1 icmp_seq=1 ttl=62 time=24.676 ms
84 bytes from 192.168.2.1 icmp_seq=2 ttl=62 time=26.075 ms
^C
PC1> ping 192.168.3.1

192.168.3.1 icmp_seq=1 timeout
84 bytes from 192.168.3.1 icmp_seq=2 ttl=59 time=51.345 ms
84 bytes from 192.168.3.1 icmp_seq=3 ttl=59 time=56.462 ms
84 bytes from 192.168.3.1 icmp_seq=4 ttl=59 time=56.523 ms
^C
PC1> ping 192.168.4.1

192.168.4.1 icmp_seq=1 timeout
84 bytes from 192.168.4.1 icmp_seq=2 ttl=59 time=58.107 ms
84 bytes from 192.168.4.1 icmp_seq=3 ttl=59 time=65.223 ms
^C
PC1> ping 192.168.5.1

192.168.5.1 icmp_seq=1 timeout
84 bytes from 192.168.5.1 icmp_seq=2 ttl=59 time=65.037 ms
84 bytes from 192.168.5.1 icmp_seq=3 ttl=59 time=55.825 ms
^C
PC1> █
```

```
PC2> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=62 time=30.208 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=62 time=26.303 ms
^C
PC2> ping 192.168.3.1

84 bytes from 192.168.3.1 icmp_seq=1 ttl=60 time=42.666 ms
84 bytes from 192.168.3.1 icmp_seq=2 ttl=60 time=44.865 ms
^C
PC2> ping 192.168.4.1

84 bytes from 192.168.4.1 icmp_seq=1 ttl=60 time=43.098 ms
84 bytes from 192.168.4.1 icmp_seq=2 ttl=60 time=46.016 ms
^C
PC2> ping 192.168.5.1

84 bytes from 192.168.5.1 icmp_seq=1 ttl=60 time=48.467 ms
84 bytes from 192.168.5.1 icmp_seq=2 ttl=60 time=45.204 ms
^C
PC2> █
```

```
PC3> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=59 time=69.429 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=59 time=56.185 ms
^C
PC3> ping 192.168.2.1

84 bytes from 192.168.2.1 icmp_seq=1 ttl=60 time=58.107 ms
84 bytes from 192.168.2.1 icmp_seq=2 ttl=60 time=56.550 ms
^C
PC3> ping 192.168.4.1

84 bytes from 192.168.4.1 icmp_seq=1 ttl=62 time=35.767 ms
84 bytes from 192.168.4.1 icmp_seq=2 ttl=62 time=25.558 ms
^C
PC3> ping 192.168.5.1

84 bytes from 192.168.5.1 icmp_seq=1 ttl=60 time=59.742 ms
84 bytes from 192.168.5.1 icmp_seq=2 ttl=60 time=45.191 ms
^C
PC3> █
```

```
PC4> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=59 time=52.985 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=59 time=55.893 ms
^C
PC4> ping 192.168.2.1

84 bytes from 192.168.2.1 icmp_seq=1 ttl=60 time=51.652 ms
84 bytes from 192.168.2.1 icmp_seq=2 ttl=60 time=45.132 ms
^C
PC4> ping 192.168.3.1

84 bytes from 192.168.3.1 icmp_seq=1 ttl=62 time=20.779 ms
84 bytes from 192.168.3.1 icmp_seq=2 ttl=62 time=27.398 ms
^C
PC4> ping 192.168.5.1

84 bytes from 192.168.5.1 icmp_seq=1 ttl=61 time=35.456 ms
84 bytes from 192.168.5.1 icmp_seq=2 ttl=61 time=36.134 ms
^C
PC4> █
```

```
PC5> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=59 time=56.547 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=59 time=55.558 ms
^C
PC5> ping 192.168.2.1

84 bytes from 192.168.2.1 icmp_seq=1 ttl=60 time=46.359 ms
84 bytes from 192.168.2.1 icmp_seq=2 ttl=60 time=45.157 ms
^C
PC5> ping 192.168.3.1

84 bytes from 192.168.3.1 icmp_seq=1 ttl=60 time=43.992 ms
84 bytes from 192.168.3.1 icmp_seq=2 ttl=60 time=45.819 ms
^C
PC5> ping 192.168.4.1

84 bytes from 192.168.4.1 icmp_seq=1 ttl=61 time=43.970 ms
84 bytes from 192.168.4.1 icmp_seq=2 ttl=61 time=35.415 ms
^C
PC5> █
```

Пункт 6

При помощи wireshark перехватим сообщения протоколов RIP v2 и OSPF, и проанализируем их:

R4_to_R5.pcapng

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

rip || ospf

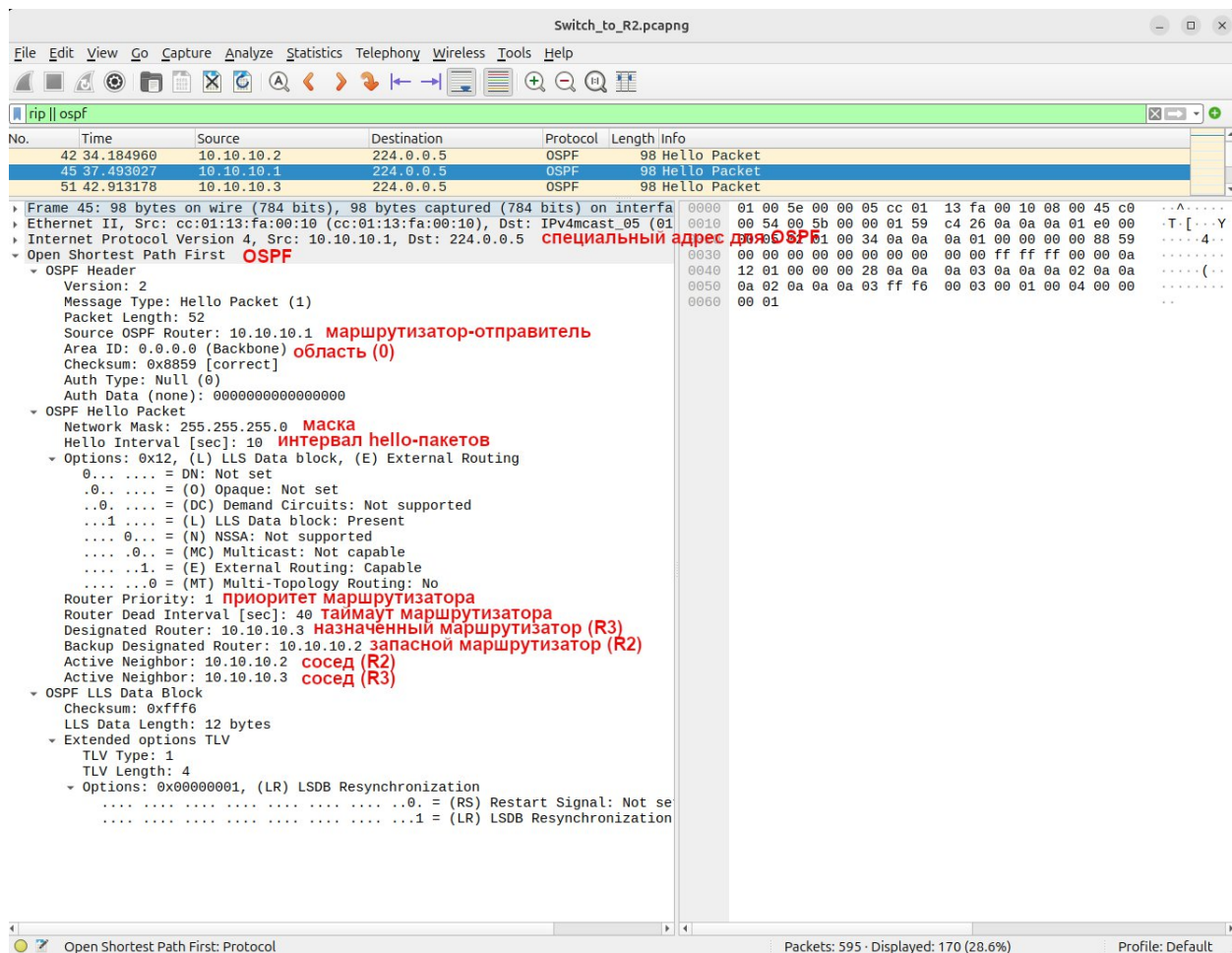
No.	Time	Source	Destination	Protocol	Length	Info
42	143.458106	10.10.1.2	224.0.0.9	RIPv2	246	Response
48	158.443201	10.10.1.1	224.0.0.9	RIPv2	66	Response
52	172.658742	10.10.1.2	224.0.0.9	RIPv2	246	Response

Frame 52: 246 bytes on wire (1968 bits), 246 bytes captured (1968 bits) on ir-
Ethernet II, Src: cc:05:14:72:00:10 (cc:05:14:72:00:10), Dst: IPv4mcast.09 (01:00:00:00:00:09)
Internet Protocol Version 4, Src: 10.10.1.2, Dst: 224.0.0.9 специальный адрес для RIPv2
User Datagram Protocol, Src Port: 520, Dst Port: 520 UDP
Routing Information Protocol (v2)
Command: Response (2)
Version: RIPv2 (2)
IP Address: 10.10.2.0, Metric: 1
Address Family: IP (2)
Route Tag: 0
IP Address: 10.10.2.0 адрес
Netmask: 255.255.255.0 маска
Next Hop: 0.0.0.0
Metric: 1 метрика ("расстояние")
IP Address: 10.10.3.0, Metric: 11
Address Family: IP (2)
Route Tag: 0
IP Address: 10.10.3.0
Netmask: 255.255.255.0
Next Hop: 0.0.0.0
Metric: 11
IP Address: 10.10.4.0, Metric: 11
Address Family: IP (2)
Route Tag: 0
IP Address: 10.10.4.0
Netmask: 255.255.255.0
Next Hop: 0.0.0.0
Metric: 11
IP Address: 10.10.5.0, Metric: 11
Address Family: IP (2)
Route Tag: 0
IP Address: 10.10.5.0
Netmask: 255.255.255.0
Next Hop: 0.0.0.0
Metric: 11
IP Address: 10.10.6.0, Metric: 11
Address Family: IP (2)
Route Tag: 0
IP Address: 10.10.6.0
Netmask: 255.255.255.0
Next Hop: 0.0.0.0
Metric: 11
IP Address: 10.10.10.0, Metric: 2
Address Family: IP (2)
Route Tag: 0
IP Address: 10.10.10.0

0000 01 00 5e 00 00 09 cc 05 14 72 00 10 08 00 45 c0
0010 00 e8 00 00 00 00 02 11 cc 30 0a 0a 01 02 e0 00
0020 08 02 08 00 d4 ab d0 02 02 00 00 00 02
0030 00 00 0a 0a 02 00 ff ff ff 00 00 00 00 00 00
0040 00 01 00 02 00 00 0a 0a 03 00 ff ff ff 00 00 00
0050 00 00 00 00 0b 00 02 00 00 0a 0a 04 00 ff ff
0060 ff 00 00 00 00 00 00 00 0b 00 02 00 00 0a 0a
0070 05 00 ff ff ff 00 00 00 00 00 00 00 0b 00 02
0080 00 00 0a 0a 06 00 ff ff ff 00 00 00 00 00 00
0090 00 0b 00 02 00 00 0a 0a 0a 00 ff ff ff 00 00 00
00a0 00 00 00 00 02 00 02 00 00 c0 a8 02 00 ff ff
00b0 ff 00 00 00 00 00 00 00 01 00 02 00 00 c0 a8
00c0 03 00 ff ff ff 00 00 00 00 00 00 00 0b 00 02
00d0 00 00 c0 a8 04 00 ff ff ff 00 00 00 00 00 00
00e0 00 0b 00 02 00 00 c0 a8 05 00 ff ff ff 00 00 00
00f0 00 00 00 00 00 0b

"r" is neither a field nor a protocol name.

Packets: 208 · Displayed: 38 (18.3%) Profile: Default



Пункт 7

Сохраним таблицы маршрутизации всех маршрутизаторов в отдельные файлы с префиксом «rt_» и именем маршрутизатора.

Пункт 8

Сохраним файлы конфигураций устройств с именами, соответствующими именам устройств. Конфигурацию получим при помощи «show running»