ОТЧЁТ

Лабораторная работа №5

“ Настройка протоколов динамической маршрутизации RIP v2 и OSPF“

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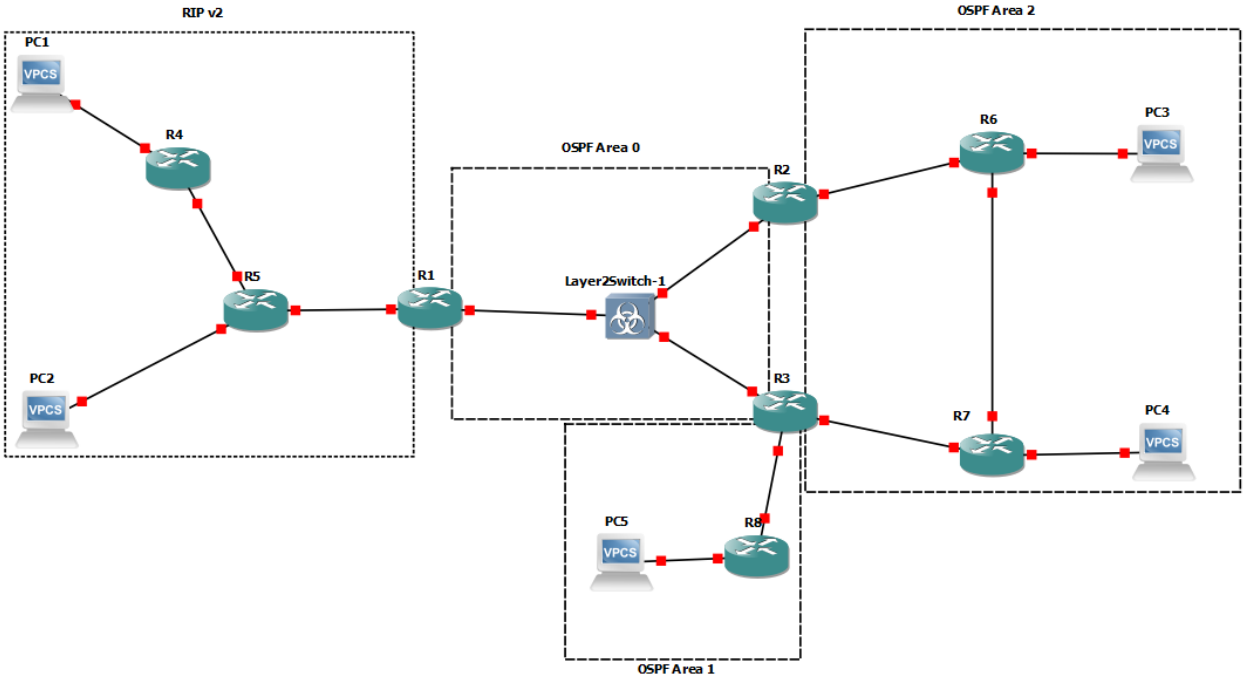
1. Для заданной на схеме schema-lab5 сети, состоящей из управляемых коммутаторов, маршрутизаторов и персональных компьютеров. Выполнить планирование и документирование адресного пространства и назначить статические адреса всем устройствам. nb! Каждое соединение маршрутизатора с маршрутизатором — это отдельная сеть.



Используем маску /29 255.255.255.248

подсеть	Назначение	Устройство	Интерфейс	IP-адрес	Шлюз по умолч.
10.10.1.0/29	R1-R5	R1	FastEthernet0/0	10.10.1.1	-
		R5	FastEthernet2/0	10.10.1.2	-
10.10.1.8/29	R4-R5	R4	FastEthernet1/0	10.10.1.9	-
		R5	FastEthernet1/0	10.10.1.10	-
10.10.1.16/29	PC2-R5	R5	FastEthernet0/0	10.10.1.17	-
		PC2	NIC	10.10.1.18	10.10.1.17
10.10.1.24/29	PC1-R4	R4	FastEthernet0/0	10.10.1.25	-
		PC1	NIC	10.10.1.26	10.10.1.25
10.10.1.32/29	R1-R2 -R3	R1	FastEthernet1/0	10.10.1.33	-
		R2	FastEthernet0/0	10.10.1.34	-
		R3	FastEthernet0/0	10.10.1.35	-
10.10.1.48/29	R2-R6	R2	FastEthernet1/0	10.10.1.49	-
		R6	FastEthernet0/0	10.10.1.50	-
10.10.1.56/29	R6-PC3	R6	FastEthernet1/0	10.10.1.57	-
		PC3	NIC	10.10.1.58	10.10.1.57
10.10.1.64/29	R6-R7	R6	FastEthernet2/0	10.10.1.65	-
		R7	FastEthernet2/0	10.10.1.66	-
10.10.1.72/29	R7-PC4	R7	FastEthernet1/0	10.10.1.73	-
		PC4	NIC	10.10.1.74	10.10.1.73
10.10.1.80/29	R3-R7	R7	FastEthernet0/0	10.10.1.81	-
		R3	FastEthernet1/0	10.10.1.82	-
10.10.1.88/29	R3-R8	R3	FastEthernet2/0	10.10.1.89	-
		R8	FastEthernet0/0	10.10.1.90	-
10.10.1.96/29		R8	FastEthernet1/0	10.10.1.97	-
		PC5	NIC	10.10.1.98	10.10.1.97

PC1
ip 10.10.1.26 255.255.255.248 10.10.1.25
save

PC2
ip 10.10.1.18 255.255.255.248 10.10.1.17
save

R4
enable
configure terminal
interface FastEthernet1/0
 ip address 10.10.1.9 255.255.255.248
 no shutdown
exit

```
interface FastEthernet0/0
 ip address 10.10.1.25 255.255.255.248
 no shutdown
exit
exit
wr

------
R5
enable
configure terminal
interface FastEthernet2/0
 ip address 10.10.1.2 255.255.255.248
 no shutdown
exit

interface FastEthernet1/0
 ip address 10.10.1.10 255.255.255.248
 no shutdown
exit


interface FastEthernet0/0
 ip address 10.10.1.17 255.255.255.248
 no shutdown
exit
exit
wr

-----
R1
enable
configure terminal
interface FastEthernet0/0
 ip address 10.10.1.1 255.255.255.248
 no shutdown
exit

interface FastEthernet1/0
 ip address 10.10.1.33 255.255.255.248
 no shutdown
exit
exit

wr

------
R2
enable
configure terminal
interface FastEthernet0/0
 ip address 10.10.1.34 255.255.255.248
 no shutdown
```

```
exit

interface FastEthernet1/0
 ip address 10.10.1.49 255.255.255.248
 no shutdown
exit
exit
wr

------
R6
enable
configure terminal
interface FastEthernet0/0
 ip address 10.10.1.50 255.255.255.248
 no shutdown
exit

interface FastEthernet1/0
 ip address 10.10.1.57 255.255.255.248
 no shutdown
exit

interface FastEthernet2/0
 ip address 10.10.1.65 255.255.255.248
 no shutdown
exit
exit

wr

-----

PC3
ip 10.10.1.58 255.255.255.248 10.10.1.57
save

-----
R7
enable
configure terminal
interface FastEthernet0/0
 ip address 10.10.1.81 255.255.255.248
 no shutdown
exit


interface FastEthernet1/0
 ip address 10.10.1.73 255.255.255.248
 no shutdown
exit

interface FastEthernet2/0
 ip address 10.10.1.66 255.255.255.248
```

```
 no shutdown
exit
exit

wr


------

R3
enable
configure terminal
interface FastEthernet0/0
 ip address 10.10.1.35 255.255.255.248
 no shutdown
exit

interface FastEthernet1/0
 ip address 10.10.1.82 255.255.255.248
 no shutdown
exit

interface FastEthernet2/0
 ip address 10.10.1.89 255.255.255.248
 no shutdown
exit

exit
wr

------
PC4
ip 10.10.1.74 255.255.255.248 10.10.1.73
save

-----
R8
enable
configure terminal
interface FastEthernet0/0
 ip address 10.10.1.90 255.255.255.248
 no shutdown
exit

interface FastEthernet1/0
 ip address 10.10.1.97 255.255.255.248
 no shutdown
exit
exit
wr
----
PC5
ip 10.10.1.98 255.255.255.248 10.10.1.97
save
```

2. Настроить протокол динамической маршрутизации RIP v2 для области, указанной на схеме schema-lab5.

R1 R4 R5
enable
configure terminal
router rip
 version 2
 network 10.10.1.0
no auto-summary
exit
exit
wr

3. Настроить протокол динамической маршрутизации OSPF для зон 0, 1, 2. Зону 1 настроить как полностью (nb!) тупиковую.

R1
enable
configure terminal
router ospf 1
network 10.10.1.32 0.0.0.7 area 0
exit
exit
wr

R2
enable
configure terminal
router ospf 1
network 10.10.1.32 0.0.0.7 area 0
network 10.10.1.48 0.0.0.7 area 2
exit
exit
wr

R3

enable
configure terminal
router ospf 1
network 10.10.1.32 0.0.0.7 area 0
network 10.10.1.80 0.0.0.7 area 2
network 10.10.1.88 0.0.0.7 area 1
area 1 stub
exit
exit
wr

R6
enable
configure terminal
router ospf 1

```
network 10.10.1.48 0.0.0.7 area 2
network 10.10.1.64 0.0.0.7 area 2
network 10.10.1.56 0.0.0.7 area 2
exit
exit
wr
```

R7

```
enable
configure terminal
router ospf 1
network 10.10.1.64 0.0.0.7 area 2
network 10.10.1.72 0.0.0.7 area 2
network 10.10.1.80 0.0.0.7 area 2
exit
exit
wr
```

R8

```
enable
configure terminal
router ospf 1
network 10.10.1.96 0.0.0.7 area 1
network 10.10.1.88 0.0.0.7 area 1
area 1 stub
exit
exit
wr
```

4. Настроить редистрибуцию маршрутов между протоколами RIP v2 и OSPF

R1

```
enable
configure terminal
router ospf 1
 network 10.10.1.32 0.0.0.7 area 0
 redistribute rip subnets
 default-metric 20
router rip
 version 2
 network 10.0.0.0
 redistribute ospf 1 metric 5
 no auto-summary
exit
exit
wr
```

5. Проверить работоспособность маршрутизации, выполнив ping VPC "все между всеми" (nb!: в обе стороны).

PC1 10.10.1.26/29
PC2 10.10.1.18/29

PC3 10.10.1.58/29
PC4 10.10.1.74/29
PC5 10.10.1.98/29

ping 10.10.1.26/29
ping 10.10.1.18/29
ping 10.10.1.58/29
ping 10.10.1.74/29
ping 10.10.1.98/29

PC1

```
PC1> ping 10.10.1.18/29

84 bytes from 10.10.1.18 icmp_seq=1 ttl=62 time=39.920 ms
84 bytes from 10.10.1.18 icmp_seq=2 ttl=62 time=25.557 ms
84 bytes from 10.10.1.18 icmp_seq=3 ttl=62 time=25.022 ms
84 bytes from 10.10.1.18 icmp_seq=4 ttl=62 time=26.749 ms
84 bytes from 10.10.1.18 icmp_seq=5 ttl=62 time=25.325 ms

PC1> ping 10.10.1.58/29

10.10.1.58 icmp_seq=1 timeout
84 bytes from 10.10.1.58 icmp_seq=2 ttl=59 time=54.008 ms
84 bytes from 10.10.1.58 icmp_seq=3 ttl=59 time=55.998 ms
84 bytes from 10.10.1.58 icmp_seq=4 ttl=59 time=65.999 ms
84 bytes from 10.10.1.58 icmp_seq=5 ttl=59 time=65.604 ms

PC1> ping 10.10.1.74/29

10.10.1.74 icmp_seq=1 timeout
84 bytes from 10.10.1.74 icmp_seq=2 ttl=59 time=54.336 ms
84 bytes from 10.10.1.74 icmp_seq=3 ttl=59 time=55.801 ms
84 bytes from 10.10.1.74 icmp_seq=4 ttl=59 time=56.261 ms
84 bytes from 10.10.1.74 icmp_seq=5 ttl=59 time=56.457 ms

PC1> ping 10.10.1.98/29

10.10.1.98 icmp_seq=1 timeout
84 bytes from 10.10.1.98 icmp_seq=2 ttl=59 time=60.173 ms
84 bytes from 10.10.1.98 icmp_seq=3 ttl=59 time=56.385 ms
84 bytes from 10.10.1.98 icmp_seq=4 ttl=59 time=56.871 ms
84 bytes from 10.10.1.98 icmp_seq=5 ttl=59 time=56.160 ms
```

PC2

```
PC2> ping 10.10.1.26/29

84 bytes from 10.10.1.26 icmp_seq=1 ttl=62 time=21.957 ms
84 bytes from 10.10.1.26 icmp_seq=2 ttl=62 time=26.085 ms
84 bytes from 10.10.1.26 icmp_seq=3 ttl=62 time=26.553 ms
84 bytes from 10.10.1.26 icmp_seq=4 ttl=62 time=25.748 ms
84 bytes from 10.10.1.26 icmp_seq=5 ttl=62 time=26.055 ms

PC2> ping 10.10.1.58/29

84 bytes from 10.10.1.58 icmp_seq=1 ttl=60 time=45.717 ms
84 bytes from 10.10.1.58 icmp_seq=2 ttl=60 time=46.390 ms
84 bytes from 10.10.1.58 icmp_seq=3 ttl=60 time=46.884 ms
84 bytes from 10.10.1.58 icmp_seq=4 ttl=60 time=45.721 ms
84 bytes from 10.10.1.58 icmp_seq=5 ttl=60 time=45.358 ms

PC2> ping 10.10.1.74/29

84 bytes from 10.10.1.74 icmp_seq=1 ttl=60 time=46.181 ms
84 bytes from 10.10.1.74 icmp_seq=2 ttl=60 time=46.274 ms
84 bytes from 10.10.1.74 icmp_seq=3 ttl=60 time=44.969 ms
84 bytes from 10.10.1.74 icmp_seq=4 ttl=60 time=46.344 ms
84 bytes from 10.10.1.74 icmp_seq=5 ttl=60 time=47.137 ms

PC2> ping 10.10.1.98/29

84 bytes from 10.10.1.98 icmp_seq=1 ttl=60 time=58.395 ms
84 bytes from 10.10.1.98 icmp_seq=2 ttl=60 time=45.347 ms
84 bytes from 10.10.1.98 icmp_seq=3 ttl=60 time=46.111 ms
84 bytes from 10.10.1.98 icmp_seq=4 ttl=60 time=46.435 ms
84 bytes from 10.10.1.98 icmp_seq=5 ttl=60 time=46.126 ms
```

PC3

```
PC3> ping 10.10.1.26/29

84 bytes from 10.10.1.26 icmp_seq=1 ttl=59 time=70.452 ms
84 bytes from 10.10.1.26 icmp_seq=2 ttl=59 time=67.610 ms
84 bytes from 10.10.1.26 icmp_seq=3 ttl=59 time=56.962 ms
84 bytes from 10.10.1.26 icmp_seq=4 ttl=59 time=56.417 ms
84 bytes from 10.10.1.26 icmp_seq=5 ttl=59 time=66.903 ms

PC3>
PC3> ping 10.10.1.18/29

84 bytes from 10.10.1.18 icmp_seq=1 ttl=60 time=61.135 ms
84 bytes from 10.10.1.18 icmp_seq=2 ttl=60 time=45.672 ms
84 bytes from 10.10.1.18 icmp_seq=3 ttl=60 time=46.293 ms
84 bytes from 10.10.1.18 icmp_seq=4 ttl=60 time=45.994 ms
84 bytes from 10.10.1.18 icmp_seq=5 ttl=60 time=46.125 ms

PC3> ping 10.10.1.74/29

84 bytes from 10.10.1.74 icmp_seq=1 ttl=62 time=39.466 ms
84 bytes from 10.10.1.74 icmp_seq=2 ttl=62 time=26.660 ms
84 bytes from 10.10.1.74 icmp_seq=3 ttl=62 time=25.832 ms
84 bytes from 10.10.1.74 icmp_seq=4 ttl=62 time=26.556 ms
84 bytes from 10.10.1.74 icmp_seq=5 ttl=62 time=26.392 ms

PC3> ping 10.10.1.98/29

84 bytes from 10.10.1.98 icmp_seq=1 ttl=60 time=58.415 ms
84 bytes from 10.10.1.98 icmp_seq=2 ttl=60 time=46.538 ms
84 bytes from 10.10.1.98 icmp_seq=3 ttl=60 time=46.239 ms
84 bytes from 10.10.1.98 icmp_seq=4 ttl=60 time=36.165 ms
84 bytes from 10.10.1.98 icmp_seq=5 ttl=60 time=45.508 ms
```

PC4

```
PC4> ping 10.10.1.26/29

84 bytes from 10.10.1.26 icmp_seq=1 ttl=59 time=58.523 ms
84 bytes from 10.10.1.26 icmp_seq=2 ttl=59 time=55.651 ms
84 bytes from 10.10.1.26 icmp_seq=3 ttl=59 time=57.167 ms
84 bytes from 10.10.1.26 icmp_seq=4 ttl=59 time=66.491 ms
84 bytes from 10.10.1.26 icmp_seq=5 ttl=59 time=56.950 ms

PC4> ping 10.10.1.18/29

84 bytes from 10.10.1.18 icmp_seq=1 ttl=60 time=56.274 ms
84 bytes from 10.10.1.18 icmp_seq=2 ttl=60 time=46.291 ms
84 bytes from 10.10.1.18 icmp_seq=3 ttl=60 time=45.900 ms
84 bytes from 10.10.1.18 icmp_seq=4 ttl=60 time=45.808 ms
84 bytes from 10.10.1.18 icmp_seq=5 ttl=60 time=48.228 ms

PC4> ping 10.10.1.58/29

84 bytes from 10.10.1.58 icmp_seq=1 ttl=62 time=23.350 ms
84 bytes from 10.10.1.58 icmp_seq=2 ttl=62 time=25.104 ms
84 bytes from 10.10.1.58 icmp_seq=3 ttl=62 time=26.060 ms
84 bytes from 10.10.1.58 icmp_seq=4 ttl=62 time=36.192 ms
84 bytes from 10.10.1.58 icmp_seq=5 ttl=62 time=26.249 ms

PC4> ping 10.10.1.98/29

84 bytes from 10.10.1.98 icmp_seq=1 ttl=61 time=42.023 ms
84 bytes from 10.10.1.98 icmp_seq=2 ttl=61 time=36.346 ms
84 bytes from 10.10.1.98 icmp_seq=3 ttl=61 time=37.169 ms
84 bytes from 10.10.1.98 icmp_seq=4 ttl=61 time=36.446 ms
84 bytes from 10.10.1.98 icmp_seq=5 ttl=61 time=35.997 ms
```

PC5

```
PC5> ping 10.10.1.26/29

84 bytes from 10.10.1.26 icmp_seq=1 ttl=59 time=67.818 ms
84 bytes from 10.10.1.26 icmp_seq=2 ttl=59 time=55.316 ms
84 bytes from 10.10.1.26 icmp_seq=3 ttl=59 time=56.028 ms
84 bytes from 10.10.1.26 icmp_seq=4 ttl=59 time=55.365 ms
84 bytes from 10.10.1.26 icmp_seq=5 ttl=59 time=56.286 ms

PC5> ping 10.10.1.18/29

84 bytes from 10.10.1.18 icmp_seq=1 ttl=60 time=50.970 ms
84 bytes from 10.10.1.18 icmp_seq=2 ttl=60 time=55.636 ms
84 bytes from 10.10.1.18 icmp_seq=3 ttl=60 time=55.997 ms
84 bytes from 10.10.1.18 icmp_seq=4 ttl=60 time=56.035 ms
84 bytes from 10.10.1.18 icmp_seq=5 ttl=60 time=45.492 ms

PC5> ping 10.10.1.58/29

84 bytes from 10.10.1.58 icmp_seq=1 ttl=60 time=66.973 ms
84 bytes from 10.10.1.58 icmp_seq=2 ttl=60 time=55.793 ms
84 bytes from 10.10.1.58 icmp_seq=3 ttl=60 time=56.159 ms
84 bytes from 10.10.1.58 icmp_seq=4 ttl=60 time=56.227 ms
84 bytes from 10.10.1.58 icmp_seq=5 ttl=60 time=56.106 ms

PC5> ping 10.10.1.74/29

84 bytes from 10.10.1.74 icmp_seq=1 ttl=61 time=33.635 ms
84 bytes from 10.10.1.74 icmp_seq=2 ttl=61 time=35.045 ms
84 bytes from 10.10.1.74 icmp_seq=3 ttl=61 time=35.306 ms
84 bytes from 10.10.1.74 icmp_seq=4 ttl=61 time=35.657 ms
84 bytes from 10.10.1.74 icmp_seq=5 ttl=61 time=35.739 ms
```

6. Перехватить в wireshark сообщения протоколов RIP v2 и OSPF, идентифицировать их тип и содержание.

2	4.237437	10.10.1.2	224.0.0.9	RIPv2	106 Response
17	20.003401	10.10.1.1	224.0.0.9	RIPv2	206 Response

Это RIPv2 Response-сообщения, которые рассылают соседям информацию о доступных сетях

2	0.521750	10.10.1.50	224.0.0.5	OSPF	94 Hello Packet
4	9.000807	10.10.1.49	224.0.0.5	OSPF	94 Hello Packet
7	10.537658	10.10.1.50	224.0.0.5	OSPF	94 Hello Packet
14	18.973105	10.10.1.49	224.0.0.5	OSPF	94 Hello Packet
16	20.531795	10.10.1.50	224.0.0.5	OSPF	94 Hello Packet

Это OSPF Hello пакеты, которые нужны для обнаружения соседей OSPF

7. Сохранить в отдельные файлы с префиксом rt_ и именем маршрутизатора таблицы маршрутизации всех маршрутизаторов.
enable
terminal length 0
show ip route
exit

8. Сохранить файлы конфигураций устройств в виде набора файлов с именами, соответствующими именам устройств.
enable
show running-config
exit