

# Разметка сети:

Между роутерами

192.168.8.0 /30 (R1-R5)

R1 - 192.168.8.2 R5 - 192.168.8.1

192.168.1.0 /30 (R4-R5)

R4 - 192.168.1.1 R5 - 192.168.1.2

192.168.4.0 /30 (R2-R6)

R2 - 192.168.4.1 R6 - 192.168.4.2

192.168.5.0 /30 (R3-R7)

R3 - 192.168.5.1 R7 - 192.168.5.2

192.168.6.0 /30 (R3-R8)

R3 - 192.168.6.2 R8 - 192.168.6.1

192.168.7.0 /30 (R6-R7)

R6 - 192.168.7.2 R7 - 192.168.7.1

Между ПК и роутерами

10.0.0.0 /24 (PC1-R4)

PC1 – 10.0.0.1 R4 - 10.0.0.254

10.0.1.0 /24 (PC2-R5)

PC2 - 10.0.1.1 R5 - 10.0.1.254

10.0.4.0 /24 (PC5-R8)

PC5 - 10.0.4.1 R8 - 10.0.4.254

10.0.2.0 /24 (PC3-R6)

PC3 - 10.0.2.1 R6 - 10.0.2.254

10.0.3.0 /24 (PC4-R7)

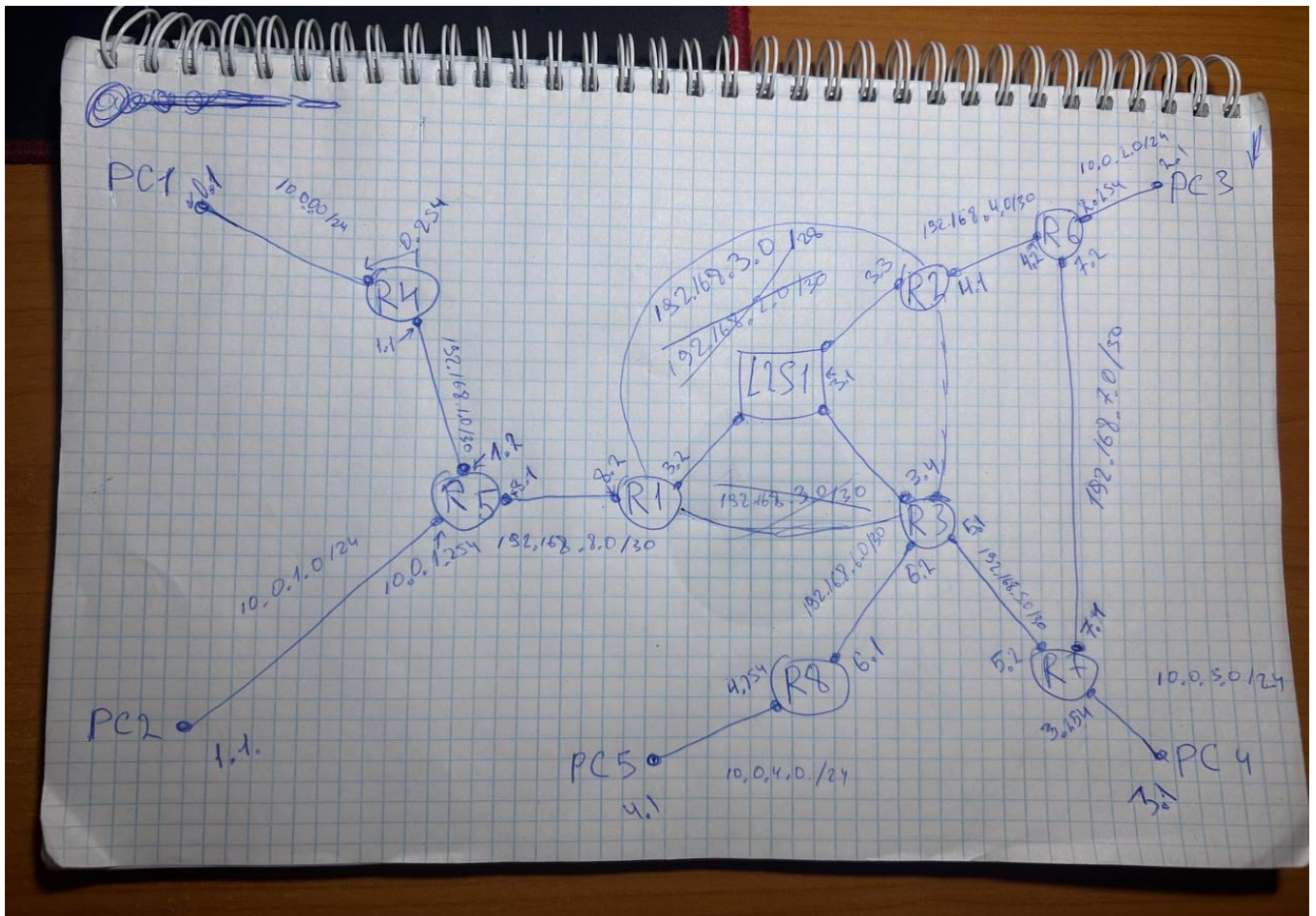
PC4 - 10.0.3.1 R7 - 10.0.3.254

Layer2Switch

192.168.3.0 255.255.255.240 (Layer2Switch-(R1,R2,R3))

Layer2Switch - 192.168.3.1 R1 - 192.168.3.2 R2 - 192.168.3.3 R3 - 192.168.3.4

# Схема сети (Вдруг интересно)



# Команды

## Роутеры:

R4#conf t

R4(config)#interface FastEthernet 0/0

R4(config-if)#ip address 10.0.0.254 255.255.255.0

R4(config-if)#interface FastEthernet 1/0

R4(config-if)#ip address 192.168.1.1 255.255.255.252

R4#conf t

R4(config)#router rip

R4(config-router)#version 2

R4(config-router)#network 10.0.0.0

R4(config-router)#network 192.168.1.0

R4(config-router)#no auto-summary

R5#conf t

R5(config)#interface fastEthernet 0/0

R5(config-if)#ip address 10.0.1.254 255.255.255.0

R5(config-if)#interface fastEthernet 1/0

R5(config-if)#ip address 192.168.1.2 255.255.255.252

R5(config-if)#interface fastEthernet 2/0

R5(config-if)#ip address 192.168.8.1 255.255.255.252

R5#conf t

R5(config)#router rip

R5(config-router)#version 2

R5(config-router)#network 192.168.1.0

R5(config-router)#network 192.168.8.0

R5(config-router)#network 10.0.1.0

R5(config-router)#no auto-summary

```
R1#conf t
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 192.168.8.2 255.255.255.252
R1(config-if)#interface fastEthernet 1/0
R1(config-if)#ip address 192.168.3.2 255.255.255.240
R1#conf t
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 192.168.8.0
R1(config-router)#network 192.168.3.0
R1(config)#router ospf 1
R1(config-router)#router-id 192.168.3.2
R1(config-router)#network 192.168.3.0 0.0.0.15 area 0
R1(config-router)#network 192.168.1.0 0.0.0.3 area 0
```

```
R1#conf t
R1(config)#router ospf 1
R1(config-router)#redistribute rip subnets metric 100
R1(config-router)#network 192.168.1.0 0.0.0.3 area 0
R1(config-router)#router rip
R1(config-router)#redistribute ospf 1 metric 5
```

```
R2#conf t
R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 192.168.3.3 255.255.255.240
R2(config-if)#interface fastEthernet 1/0
```

```
R2(config-if)#ip address 192.168.1.9 255.255.255.252
R2#conf t
R2(config)#router ospf 1
R2(config-router)#router-id 192.168.3.3
R2(config-router)#network 192.168.3.0 0.0.0.15 area 0
R2(config-router)#network 192.168.1.8 0.0.0.3 area 2
```

```
R3#conf t
R3(config)#interface fastEthernet 0/0
R3(config-if)#ip address 192.168.3.4 255.255.255.240
R3(config-if)#interface fastEthernet 1/0
R3(config-if)#ip address 192.168.5.1 255.255.255.252
R3(config-if)#interface fastEthernet 2/0
R3(config-if)#ip address 192.168.6.2 255.255.255.252
R3#conf t
R3(config)#router ospf 1
R3(config-router)#router-id 192.168.3.4
R3(config-router)#network 192.168.3.0 0.0.0.15 area 0
R3(config-router)# network 192.168.5.0 0.0.0.3 area 2
R3(config-router)# network 192.168.6.0 0.0.0.3 area 1
```

```
R8#conf t
R8(config)#interface fastEthernet 0/0
R8(config-if)#ip address 192.168.6.1 255.255.255.252
R8(config-if)#interface fastEthernet 1/0
R8(config-if)#ip address 10.0.4.254 255.255.255.0
R8#conf t
```

```
R8(config)#router ospf 1
R8(config-router)#router-id 192.168.6.1
R8(config-router)#network 192.168.6.1 0.0.0.3 area 1
R8(config-router)#network 10.0.4.0 0.0.0.255 area 1
R8(config-router)#area 1 stub
```

```
R6#conf t
R6(config)#interface fastEthernet 0/0
R6(config-if)#ip address 192.168.4.2 255.255.255.252
R6(config-if)#interface fastEthernet 1/0
R6(config-if)#ip address 10.0.2.254 255.255.255.0
R6(config-if)#interface fastEthernet 2/0
R6(config-if)#ip address 192.168.7.2 255.255.255.252
R6#conf t
R6(config)#router ospf 1
R6(config-router)#router-id 192.168.4.2
R6(config-router)#network 192.168.4.0 0.0.0.3 area 2
R6(config-router)# network 192.168.7.0 0.0.0.3 area 2
R6(config-router)# network 10.0.2.0 0.0.0.15 area 2
```

```
R7#conf t
R7(config)#interface fastEthernet 0/0
R7(config-if)#ip address 192.168.5.2 255.255.255.252
R7(config-if)#interface fastEthernet 1/0
R7(config-if)#ip address 10.0.3.254 255.255.255.0
R7(config-if)#interface fastEthernet 2/0
```

R7(config-if)#ip address 192.168.7.1 255.255.255.252

R7#conf t

R7(config)#router ospf 1

R7(config-router)#router-id 192.168.5.2

R7(config-router)# network 192.168.5.0 0.0.0.3 area 2

R7(config-router)# network 192.168.7.0 0.0.0.255 area 2

R7(config-router)# network 10.0.3.0 0.0.0.255 area 2

RIP V2

No.	Time	Source	Destination	Protocol	Length	Info
5	7.764103	192.168.8.2	224.0.0.9	RIPv2	206	Response
12	24.720567	192.168.8.1	224.0.0.9	RIPv2	106	Response
17	37.357087	192.168.8.2	224.0.0.9	RIPv2	206	Response
24	55.312573	192.168.8.1	224.0.0.9	RIPv2	106	Response

Frame 17: 206 bytes on wire (1648 bits), 206 bytes captured (1648 bits) on interface -, id 0  
Ethernet II, Src: cc:01:49:8b:00:00 (cc:01:49:8b:00:00), Dst: IPv4mcast 09 (01:00:5e:00:00:09)  
Internet Protocol Version 4, Src: 192.168.8.2, Dst: 224.0.0.9  
User Datagram Protocol, Src Port: 520, Dst Port: 520  
Routing Information Protocol  
Command: Response (2)  
Version: RIPv2 (2)  
IP Address: 10.0.2.0, Metric: 5  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 10.0.2.0  
Netmask: 255.255.255.0  
Next Hop: 0.0.0.0  
Metric: 5  
IP Address: 10.0.3.0, Metric: 5  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 10.0.3.0  
Netmask: 255.255.255.0  
Next Hop: 0.0.0.0  
Metric: 5  
IP Address: 10.0.4.0, Metric: 5  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 10.0.4.0  
Netmask: 255.255.255.0  
Next Hop: 0.0.0.0  
Metric: 5  
IP Address: 192.168.3.0, Metric: 1  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 192.168.3.0  
Netmask: 255.255.255.240  
Next Hop: 0.0.0.0  
Metric: 1  
IP Address: 192.168.4.0, Metric: 5  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 192.168.4.0  
Netmask: 255.255.255.252  
Next Hop: 0.0.0.0  
Metric: 5  
IP Address: 192.168.5.0, Metric: 5  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 192.168.5.0  
Netmask: 255.255.255.252  
Next Hop: 0.0.0.0  
Metric: 5  
IP Address: 192.168.6.0, Metric: 5  
Address Family: IP (2)  
Route Tag: 0  
IP Address: 192.168.6.0  
Netmask: 255.255.255.252

# OSPF

ospf						
No.	Time	Source	Destination	Protocol	Length	Info
16	34.153962	192.168.4.2	224.0.0.5	OSPF	94	Hello Packet
18	38.247345	192.168.4.1	224.0.0.5	OSPF	94	Hello Packet
21	44.183088	192.168.4.2	224.0.0.5	OSPF	94	Hello Packet
22	48.243123	192.168.4.1	224.0.0.5	OSPF	94	Hello Packet

Frame 4: 94 bytes on wire (752 bits), 94 bytes captured (752 bits) on interface -, id 0

Ethernet II, Src: cc:02:49:a9:00:10 (cc:02:49:a9:00:10), Dst: IPv4mcast\_05 (01:00:5e:00:00:05)

Internet Protocol Version 4, Src: 192.168.4.1, Dst: 224.0.0.5

Open Shortest Path First

- OSPF Header
  - Version: 2
  - Message Type: Hello Packet (1) **Тип сообщения**
  - Packet Length: 48
  - Source OSPF Router: 192.168.3.3 **ip роутера**
  - Area ID: 0.0.0.2
  - Checksum: 0xd9f1 [correct]
  - Auth Type: Null (0)
  - Auth Data (none): 0000000000000000
- OSPF Hello Packet
  - Network Mask: 255.255.255.252 **маска**
  - Hello Interval [sec]: 10 **интервал сообщений**
  - Options: 0x12, (L) LLS Data block, (E) External Routing
    - 0... .... = DN: Not set
    - .0.. .... = (O) Opaque: Not set
    - ..0. .... = (DC) Demand Circuits: Not supported
    - ...1 .... = (L) LLS Data block: Present
    - .... 0... = (N) NSSA: Not supported
    - .... .0.. = (MC) Multicast: Not capable
    - .... ..1. = (E) External Routing: Capable
    - .... ...0 = (MT) Multi-Topology Routing: No
  - Router Priority: 1
  - Router Dead Interval [sec]: 40 **время пропажи**
  - Designated Router: 192.168.4.1
  - Backup Designated Router: 192.168.4.2
  - Active Neighbor: 192.168.4.2
- OSPF LLS Data Block
  - Checksum: 0xffff6
  - LLS Data Length: 12 bytes
- Extended options TLV
  - TLV Type: 1
  - TLV Length: 4
    - Options: 0x00000001, (LR) LSDB Resynchronization
      - .... .... = (RS) Restart Signal: Not set
      - .... ....1 = (LR) LSDB Resynchronization: Set