Университет ИТМО

Факультет программной инженерии и компьютерной техники

Администрирование вычислительных систем

Лабораторная работа № 2

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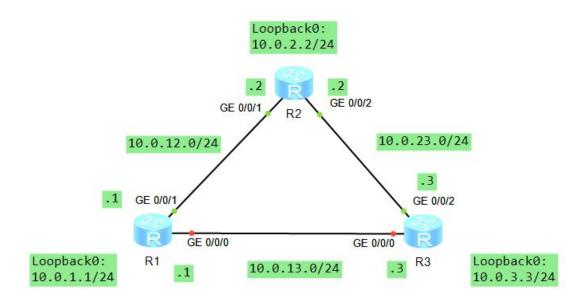
Группа Р3410

Оглавление

Задание 4.1	2
Реализованная топология:	2
1. Настраиваем устройство R1:	2
2. Проверяем соединение:	4
3. Настраиваем статические маршруты на R2:	6
4. Настраиваем резервные статические маршруты:	6
5. Проверяем статические маршруты:	6
6. Проверяем резервные статические маршруты:	8
7. Проверяем и настраиваем маршруты по умолчанию	9
8. Конфигурируем резервный маршрут по умолчанию	11
9. Тестируем резервный маршрут по умолчанию	11
Задание 4.2	14
Реализованная топология:	14
1. Подготовка среды:	14
2. Настройка OSPF:	15
3. Проверки конфигурации OSPF	15
4. Изменение интервала "Hello" и интервала "Dead" OSPF	20
5. Объявление статических маршрутов по умолчанию	21
6. Управление выбором DR и BDR	23
Задание 5.2	24
Реализованная топология:	24
1. Настройка устройств:	24
3. Дополнительная конфигурация:	24
4. Включение DHCP:	27
Создание глобального пула IP-адресов	27
Создание пула IP-адресов на основе интерфейса:	29

Задание 4.1

Реализованная топология:



1. Настраиваем устройство R1:

```
<Huawei>system-view
[Huawei]sysname R1
[R1]int gi0/0/0
[R1-GigabitEthernet0/0/0]ip address 10.0.13.1 24
[R1-GigabitEthernet0/0/0]quit
[R1]int gi0/0/1
[R1-GigabitEthernet0/0/1]ip address 10.0.12.1 24
[R1-GigabitEthernet0/0/1]quit
[R1]int LookBack0
[R1-LoopBack0]ip address 10.0.1.1 24
```

Проверяем конфигурацию:

[R1]disp ip int brief			
Interface	IP Address/Mask	Physi	cal
Protocol			
GigabitEthernet0/0/0	10.0.13.1/24	ир	up
GigabitEthernet0/0/1	10.0.12.1/24	up	-
up			
GigabitEthernet0/0/2	unassigned	ир	
down	-	-	
LoopBack0	10.0.1.1/24	up	
up(s)		-	

Настраиваем устройство R2:

```
<Huawei>system-view
[Huawei]sysname R2
[R2]int gi0/0/1
[R2-GigabitEthernet0/0/1]ip address 10.0.12.2 24
[R2-GigabitEthernet0/0/1]quit
[R2]int gi0/0/2
[R2-GigabitEthernet0/0/2]ip address 10.0.23.2 24
[R2-GigabitEthernet0/0/2]quit
[R2]int LookBack0
[R2-LoopBack0]ip address 10.0.2.2 24
```

Проверяем конфигурацию:

[R1]disp ip int brief			
•••			_
Interface	IP Address/Mask	Physi	cal
Protocol			
GigabitEthernet0/0/0	unassigned	up	down
GigabitEthernet0/0/1	10.0.12.2/24	up	up
GigabitEthernet0/0/2	10.0.23.2/24	up	up
LoopBack0	10.0.2.2/24	up	
up(s)			
•••			

Настраиваем устройство R3:

```
<Huawei>system-view
[Huawei]sysname R3
[R3]int gi0/0/0
[R3-GigabitEthernet0/0/0]ip address 10.0.13.3 24
[R3-GigabitEthernet0/0/0]quit
[R3]int gi0/0/2
[R3-GigabitEthernet0/0/2]ip address 10.0.23.3 24
[R3-GigabitEthernet0/0/2]quit
[R3]int LookBack0
[R3-LoopBack0]ip address 10.0.3.3 24
```

Проверяем конфигурацию:

[R3]disp ip int brief			
Interface Protocol	IP Address/Mask	Physi	cal
GigabitEthernet0/0/0 GigabitEthernet0/0/1 GigabitEthernet0/0/2 LoopBack0 up(s)	10.0.13.3/24 unassigned 10.0.23.3/24 10.0.3.3/24	up up up up	up down up

. . .

2. Проверяем соединение:

```
<R1>ping 10.0.12.2
 PING 10.0.12.2: 56 data bytes, press CTRL C to break
   Reply from 10.0.12.2: bytes=56 Sequence=1 ttl=255 time=310 ms
   Reply from 10.0.12.2: bytes=56 Sequence=2 ttl=255 time=30 ms
   Reply from 10.0.12.2: bytes=56 Sequence=3 ttl=255 time=30 ms
   Reply from 10.0.12.2: bytes=56 Sequence=4 ttl=255 time=30 ms
   Reply from 10.0.12.2: bytes=56 Sequence=5 ttl=255 time=20 ms
 --- 10.0.12.2 ping statistics ---
    5 packet(s) transmitted
   5 packet(s) received
   0.00% packet loss
   round-trip min/avg/max = 20/84/310 ms
<R1>ping 10.0.13.3
 PING 10.0.13.3: 56 data bytes, press CTRL C to break
   Reply from 10.0.13.3: bytes=56 Sequence=1 ttl=255 time=30 ms
   Reply from 10.0.13.3: bytes=56 Sequence=2 ttl=255 time=30 ms
   Reply from 10.0.13.3: bytes=56 Sequence=3 ttl=255 time=30 ms
   Reply from 10.0.13.3: bytes=56 Sequence=4 ttl=255 time=20 ms
   Reply from 10.0.13.3: bytes=56 Sequence=5 ttl=255 time=20 ms
  --- 10.0.13.3 ping statistics ---
   5 packet(s) transmitted
   5 packet(s) received
   0.00% packet loss
   round-trip min/avg/max = 20/26/30 ms
<R2>ping 10.0.23.3
 PING 10.0.23.3: 56 data bytes, press CTRL C to break
   Reply from 10.0.23.3: bytes=56 Sequence=1 ttl=255 time=120 ms
   Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=255 time=20 ms
   Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=255 time=40 ms
   Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=255 time=20 ms
   Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=255 time=30 ms
  --- 10.0.23.3 ping statistics ---
    5 packet(s) transmitted
   5 packet(s) received
   0.00% packet loss
   round-trip min/avg/max = 20/46/120 ms
<R2>ping 10.0.13.3
 PING 10.0.13.3: 56
                     data bytes, press CTRL C to break
   Request time out
   Request time out
   Request time out
   Request time out
   Request time out
```

```
--- 10.0.13.3 ping statistics ---
5 packet(s) transmitted
0 packet(s) received
100.00% packet loss

<R2>ping 10.0.3.3
PING 10.0.3.3: 56 data bytes, press CTRL_C to break
Request time out
--- 10.0.3.3 ping statistics ---
5 packet(s) transmitted
0 packet(s) received
100.00% packet loss
```

Выводим таблицу маршрутизации:

<pre><r2>disp ip routing-table Route Flags: R - relay, D - download to fib</r2></pre>							
Routing Tables: Pub							
Destinatio	ns : 13		Routes :	13			
Destination/Mask Interface	Proto	Pre	Cost	Flags	NextHop		
10.0.2.0/24	Direct	0	0	D	10.0.2.2		
LoopBack0							
10.0.2.2/32	Direct	0	0	D	127.0.0.1		
LoopBack0				_			
10.0.2.255/32	Direct	0	0	D	127.0.0.1		
LoopBack0 10.0.12.0/24	Direct	0	0	D	10.0.12.2		
GigabitEthernet0/0/		O	O	D	10.0.12.2		
10.0.12.2/32		0	0	D	127.0.0.1		
GigabitEthernet0/0/	1						
10.0.12.255/32	Direct	0	0	D	127.0.0.1		
GigabitEthernet0/0/							
10.0.23.0/24		0	0	D	10.0.23.2		
GigabitEthernet0/0/		0	0	.	107.0.01		
10.0.23.2/32 GigabitEthernet0/0/		0	0	D	127.0.0.1		
10.0.23.255/32		0	0	D	127.0.0.1		
GigabitEthernet0/0/		J	J	D	127.0.0.1		
127.0.0.0/8		0	0	D	127.0.0.1		
InLoopBack0							
127.0.0.1/32	Direct	0	0	D	127.0.0.1		

3. Настраиваем статические маршруты на R2:

```
[R2]ip route-static 10.0.13.0 24 10.0.23.3
[R2]ip route-static 10.0.3.0 24 10.0.23.3
[R2]disp ip routing-table
Route Flags: R - relay, D - download to fib
Routing Tables: Public
       Destinations: 15 Routes: 15
Destination/Mask Proto Pre Cost Flags NextHop
Interface
      10.0.2.0/24 Direct 0 0
                                      D
                                          10.0.2.2
LoopBack0
      10.0.2.2/32 Direct 0 0
                                D 127.0.0.1
LoopBack0
                                D 127.0.0.1
    10.0.2.255/32 Direct 0 0
LoopBack0
      10.0.3.0/24 Static 60
                                    RD 10.0.23.3
                            0
GigabitEthernet0/0/2
     10.0.12.0/24 Direct 0 0
                                     D
                                         10.0.12.2
GigabitEthernet0/0/1
     10.0.12.2/32 Direct 0 0
                                     D 127.0.0.1
GigabitEthernet0/0/1
   10.0.12.255/32 Direct 0 0
                               D 127.0.0.1
GigabitEthernet0/0/1
     10.0.13.0/24 Static 60
                            0
                               RD 10.0.23.3
GigabitEthernet0/0/2
```

4. Настраиваем резервные статические маршруты:

```
[R1]ip route-static 10.0.3.0 24 10.0.13.3

[R2]ip route-static 10.0.13.0 24 10.0.12.1 preference 80

[R2]ip route-static 10.0.3.0 24 10.0.12.1 preference 80

[R3]ip route-static 10.0.12.0 24 10.0.13.1
```

5. Проверяем статические маршруты:

```
[R2]disp ip routing-table
Route Flags: R - relay, D - download to fib
```

```
Routing Tables: Public
         Destinations: 15
                                  Routes: 15
Destination/Mask
                    Proto
                            Pre
                                 Cost
                                            Flags NextHop
Interface
       10.0.2.0/24 Direct
                                  0
                                                  10.0.2.2
LoopBack0
                                  \cap
                                                  127.0.0.1
       10.0.2.2/32 Direct
                            \Omega
                                              D
LoopBack0
     10.0.2.255/32
                            0
                                  \cap
                                                  127.0.0.1
                   Direct
                                              D
LoopBack0
                                                 10.0.23.3
       10.0.3.0/24
                    Static 60
                                 Λ
                                            RD
GigabitEthernet0/0/2
      10.0.12.0/24 Direct
                                                  10.0.12.2
                                  0
                                              D
GigabitEthernet0/0/1
      10.0.12.2/32 Direct
                                  0
                                                  127.0.0.1
                                              D
GigabitEthernet0/0/1
    10.0.12.255/32 Direct
                                                  127.0.0.1
                                  0
                                             D
GigabitEthernet0/0/1
      10.0.13.0/24 Static 60
                                            RD
                                                 10.0.23.3
GigabitEthernet0/0/2
      10.0.23.0/24 Direct
                                                  10.0.23.2
                                              D
GigabitEthernet0/0/2
      10.0.23.2/32 Direct
                                  0
                                              D
                                                  127.0.0.1
GigabitEthernet0/0/2
    10.0.23.255/32 Direct
                                  \cap
                                                  127.0.0.1
                                              D
GigabitEthernet0/0/2
      127.0.0.0/8
                            0
                                  \cap
                                              D
                                                  127.0.0.1
                   Direct
InLoopBack0
      127.0.0.1/32 Direct
                            0
                                  0
                                                  127.0.0.1
                                              D
InLoopBack0
127.255.255.255/32 Direct
                            0
                                  \cap
                                              D
                                                  127.0.0.1
InLoopBack0
255.255.255.255/32 Direct
                                  0
                                              D
                                                  127.0.0.1
InLoopBack0
R2>ping 10.0.13.3
  PING 10.0.13.3: 56 data bytes, press CTRL_C to break
    Reply from 10.0.13.3: bytes=56 Sequence=1 ttl=255 time=30 ms
    Reply from 10.0.13.3: bytes=56 Sequence=2 ttl=255 time=30 ms
    Reply from 10.0.13.3: bytes=56 Sequence=3 ttl=255 time=30 ms
    Reply from 10.0.13.3: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 10.0.13.3: bytes=56 Sequence=5 ttl=255 time=20 ms
  --- 10.0.13.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/26/30 ms
R2>ping 10.0.3.3
  PING 10.0.3.3: 56 data bytes, press CTRL C to break
    Reply from 10.0.3.3: bytes=56 Sequence=1 ttl=255 time=90 ms
    Reply from 10.0.3.3: bytes=56 Sequence=2 ttl=255 time=30 ms
    Reply from 10.0.3.3: bytes=56 Sequence=3 ttl=255 time=30 ms
```

```
Reply from 10.0.3.3: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 10.0.3.3: bytes=56 Sequence=5 ttl=255 time=10 ms
  --- 10.0.3.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 10/36/90 ms
<R2>tracert 10.0.13.3
traceroute to 10.0.13.3(10.0.13.3), max hops: 30 ,packet
length: 40,press CTRL C
to break
1 10.0.23.3 30 ms 20 ms 40 ms
<R2>tracert 10.0.3.3
traceroute to 10.0.3.3(10.0.3.3), max hops: 30 ,packet length:
40, press CTRL C
to break
 1 10.0.23.3 30 ms 20 ms
                           40 ms
```

6. Проверяем резервные статические маршруты:

[R2]int gi0/0/2 [R2-GigabitEthernet0 [R2-GigabitEthernet0	_		'n		
[R2]disp ip routing- Route Flags: R - rel		· down	load to	fib	
Routing Tables: Publ	ic				
Destination	ıs : 15		Routes	: 15	
Destination/Mask	Proto	Pre	Cost	Flags	NextHop
Interface					
10.0.2.0/24	Direct	0	0	D	10.0.2.2
LoopBack0				_	
10.0.2.2/32	Direct	0	0	D	127.0.0.1
LoopBack0	D-1	0	0	D	127 0 0 1
10.0.2.255/32	Direct	U	0	D	127.0.0.1
LoopBack0 10.0.3.0/24	Statio	60	0	RD	10.0.23.3
GigabitEthernet0/0/2	Static	80	U	KD.	10.0.23.3
10.0.12.0/24	Direct	0	0	D	10.0.12.2
GigabitEthernet0/0/1		· ·	v	_	1010111
10.0.12.2/32		0	0	D	127.0.0.1
GigabitEthernet0/0/1					
10.0.12.255/32	Direct	0	0	D	127.0.0.1
GigabitEthernet0/0/1					
10.0.13.0/24	Static	60	0	RD	10.0.23.3
GigabitEthernet0/0/2					
10.0.23.0/24		0	0	D	10.0.23.2
GigabitEthernet0/0/2					

```
10.0.23.2/32 Direct
                                 0
                                              D
                                                  127.0.0.1
GigabitEthernet0/0/2
    10.0.23.255/32
                    Direct
                                 \cap
                                             D
                                                 127.0.0.1
GigabitEthernet0/0/2
      127.0.0.0/8
                                                 127.0.0.1
                  Direct
                            \cap
                                 \cap
                                              D
InLoopBack0
      127.0.0.1/32 Direct
                            0
                                 0
                                              D
                                                 127.0.0.1
InLoopBack0
127.255.255.255/32 Direct
                            0
                                 0
                                              D
                                                 127.0.0.1
InLoopBack0
255.255.255.255/32 Direct
                                 0
                                                 127.0.0.1
InLoopBack0
<R2>ping 10.0.13.3
  PING 10.0.13.3: 56 data bytes, press CTRL_C to break
    Reply from 10.0.13.3: bytes=56 Sequence=1 ttl=255 time=30 ms
    Reply from 10.0.13.3: bytes=56 Sequence=2 ttl=255 time=30 ms
    Reply from 10.0.13.3: bytes=56 Sequence=3 ttl=255 time=30 ms
    Reply from 10.0.13.3: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 10.0.13.3: bytes=56 Sequence=5 ttl=255 time=20 ms
  --- 10.0.13.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/26/30 ms
<R2>ping 10.0.3.3
  PING 10.0.3.3: 56 data bytes, press CTRL_C to break
    Reply from 10.0.3.3: bytes=56 Sequence=1 ttl=255 time=90 ms
    Reply from 10.0.3.3: bytes=56 Sequence=2 ttl=255 time=30 ms
    Reply from 10.0.3.3: bytes=56 Sequence=3 ttl=255 time=30 ms
    Reply from 10.0.3.3: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 10.0.3.3: bytes=56 Sequence=5 ttl=255 time=10 ms
  --- 10.0.3.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 10/36/90 ms
<R2>tracert 10.0.13.3
traceroute to 10.0.13.3(10.0.13.3), max hops: 30 ,packet
length: 40, press CTRL C
to break
1 10.0.12.1 30 ms 20 ms
                           40 ms
2 10.0.13.3 20 ms 20 ms
                           40 ms
<R2>tracert 10.0.3.3
traceroute to 10.0.3.3(10.0.3.3), max hops: 30 ,packet length:
40, press CTRL C
to break
1 10.0.12.1 30 ms 20 ms
                           40 ms
2 10.0.13.3 20 ms 20 ms
                           40 ms
```

7. Проверяем и настраиваем маршруты по умолчанию

```
[R2]int gi0/0/2
[R2-GigabitEthernet0/0/2]undo shutdown
<R1>ping 10.0.23.3
 PING 10.0.23.3: 56 data bytes, press CTRL C to break
   Request time out
   Request time out
   Request time out
   Request time out
   Request time out
 --- 10.0.23.3 ping statistics ---
   5 packet(s) transmitted
   0 packet(s) received
   100.00% packet loss
<R1>disp ip routing-table
Route Flags: R - relay, D - download to fib
______
Routing Tables: Public
      Destinations: 14 Routes: 14
Destination/Mask Proto Pre Cost Flags NextHop
Interface
     10.0.1.0/24 Direct 0 0
                                    D 10.0.1.1
LoopBack0
                                   D 127.0.0.1
    10.0.1.1/32 Direct 0 0
LoopBack0
   10.0.1.255/32 Direct 0 0
                                    D 127.0.0.1
LoopBack0
    10.0.3.0/24 Static 60 0 RD 10.0.13.3
GigabitEthernet0/0/0
    10.0.12.0/24 Direct 0 0
                              D 10.0.12.1
GigabitEthernet0/0/1
                              D 127.0.0.1
    10.0.12.1/32 Direct 0 0
GigabitEthernet0/0/1
                                    D 127.0.0.1
   10.0.12.255/32 Direct 0 0
GigabitEthernet0/0/1
                                  D 10.0.13.1
    10.0.13.0/24 Direct 0 0
GigabitEthernet0/0/0
    10.0.13.1/32 Direct 0 0
                              D 127.0.0.1
GigabitEthernet0/0/0
    10.0.13.255/32 Direct 0 0 D 127.0.0.1
GigabitEthernet0/0/0
    127.0.0.0/8 Direct 0 0
                                    D 127.0.0.1
InLoopBack0
    127.0.0.1/32 Direct 0 0
                                    D 127.0.0.1
InLoopBack0
                              D 127.0.0.1
127.255.255.255/32 Direct 0 0
InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1
InLoopBack0
```

```
<R1>sys
[R1]ip route-static 0.0.0.0 0.0.0 10.0.13.3
[R1]ping 10.0.23.3
PING 10.0.23.3: 56 data bytes, press CTRL_C to break
Reply from 10.0.23.3: bytes=56 Sequence=1 ttl=254 time=30 ms
Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=254 time=30 ms
Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=254 time=30 ms
Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=254 time=40 ms
Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=254 time=40 ms
Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=254 time=30 ms
--- 10.0.23.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 30/32/40 ms
```

8. Конфигурируем резервный маршрут по умолчанию

```
[R1]ip route-static 0.0.0.0 0.0.0.0 10.0.12.2 preference 80 [R3]ip route-static 10.0.12.0 24 10.0.23.2 preference 80
```

9. Тестируем резервный маршрут по умолчанию

[R1]disp ip routing Route Flags: R - re		- dour	aload to	fih		
		- aowi				
Routing Tables: Puk	olic					
Destination	ons : 15		Routes	: 15		
Destination/Mask	Proto	Pre	Cost	Flag	gs NextHop	
Interface						
0.0.0.0/0		60	0	RD	10.0.13.3	
GigabitEthernet0/0/						
10.0.1.0/24	Direct	0	0	D	10.0.1.1	
LoopBack0		0	0	_	100 0 0 1	
10.0.1.1/32	Direct	Ü	0	D	127.0.0.1	
LoopBack0	D: .	0	0	.	107 0 0 1	
10.0.1.255/32	Direct	U	0	D	127.0.0.1	
LoopBack0 10.0.3.0/24	Ctotio	60	0	RD	10.0.13.3	
GigabitEthernet0/0/		00	U	KD	10.0.13.3	
10.0.12.0/24		Ω	0	D	10.0.12.1	
GigabitEthernet0/0/		O	O	D	10.0.12.1	
10.0.12.1/32		0	0	D	127.0.0.1	
GigabitEthernet0/0/		Ŭ	Ŭ	2	127.0.01	
10.0.12.255/32		0	0	D	127.0.0.1	
GigabitEthernet0/0/		ŭ	· ·	_	127.00.01	
10.0.13.0/24		0	0	D	10.0.13.1	
GigabitEthernet0/0/						
10.0.13.1/32		0	0	D	127.0.0.1	
GigabitEthernet0/0/	0					

```
0
     10.0.13.255/32 Direct 0
                                              127.0.0.1
GigabitEthernet0/0/0
     127.0.0.0/8 Direct 0
                              0
                                        D 127.0.0.1
InLoopBack0
     127.0.0.1/32 Direct 0
                              0
                                        D 127.0.0.1
InLoopBack0
127.255.255.255/32 Direct 0
                                        D 127.0.0.1
                              0
InLoopBack0
                                       D 127.0.0.1
255.255.255.255/32 Direct 0 0
InLoopBack0
[R1] int gi0/0/0
[R1-GigabitEthernet0/0/0] shutdown
[R1-GigabitEthernet0/0/0]quit
[R3]int gi0/0/0
[R3-GigabitEthernet0/0/0] shutdown
[R3-GigabitEthernet0/0/0]quit
[R1] disp ip routing-table
Route Flags: R - relay, D - download to fib
   -----
Routing Tables: Public
        Destinations : 11
                         Routes : 11
Destination/Mask Proto Pre Cost Flags NextHop
Interface
       0.0.0.0/0 Static 80
                             0
                                       RD
                                            10.0.12.2
GigabitEthernet0/0/1
      10.0.1.0/24 Direct 0
                             0
                                        D 10.0.1.1
LoopBack0
      10.0.1.1/32 Direct 0
                             0
                                        D 127.0.0.1
LoopBack0
    10.0.1.255/32 Direct 0
                              0
                                        D
                                           127.0.0.1
LoopBack0
     10.0.12.0/24 Direct 0
                              0
                                        D 10.0.12.1
GigabitEthernet0/0/1
     10.0.12.1/32 Direct 0
                                        D 127.0.0.1
GigabitEthernet0/0/1
   10.0.12.255/32 Direct 0
                              0
                                        D 127.0.0.1
GigabitEthernet0/0/1
     127.0.0.0/8 Direct 0
                                        D 127.0.0.1
                              0
InLoopBack0
     127.0.0.1/32 Direct 0
                              \cap
                                        D 127.0.0.1
InLoopBack0
127.255.255.255/32 Direct 0
                              0
                                        D 127.0.0.1
InLoopBack0
255.255.255.255/32 Direct 0 0
                                    D 127.0.0.1
InLoopBack0
[R1]ping 10.0.23.3
 PING 10.0.23.3: 56 data bytes, press CTRL C to break
   Reply from 10.0.23.3: bytes=56 Sequence=1 ttl=254 time=30 ms
   Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=254 time=20 ms
   Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=254 time=30 ms
```

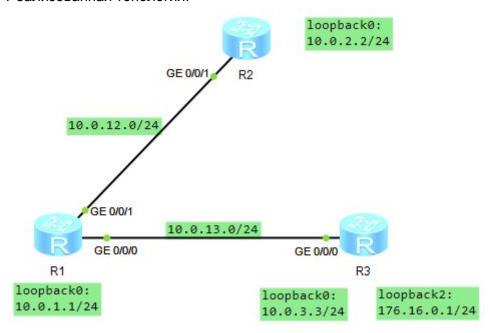
```
Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=254 time=20 ms
Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=254 time=30 ms

--- 10.0.23.3 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 20/26/30 ms

[R1]tracert 10.0.23.3
traceroute to 10.0.23.3(10.0.23.3), max hops: 30 ,packet
length: 40,press CTRL
C to break
1 10.0.12.2 30 ms 40 ms 10 ms
2 10.0.23.3 30 ms 30 ms 20 ms
```

Задание 4.2

Реализованная топология:



1. Подготовка среды:

```
[Huawei]sysname R1
[R1]interface GigabitEthernet 0/0/1
[R1-GigabitEthernet0/0/1]ip address 10.0.12.1 24
[R1-GigabitEthernet0/0/1]quit
[R1]interface GigabitEthernet 0/0/0
[R1-GigabitEthernet0/0/0]ip address 10.0.13.1 24
[R1-GigabitEthernet0/0/0]quit
[R1]interface LoopBack 0
[R1-LoopBack0]ip address 10.0.1.1 24
[R1-LoopBack0]quit
```

```
[Huawei]sysname R2
[R2]interface GigabitEthernet 0/0/1
[R2-GigabitEthernet0/0/1]ip address 10.0.12.2 24
[R2-GigabitEthernet0/0/1]quit
[R2]interface LoopBack 0
[R2-LoopBack0]ip address 10.0.2.2 24
[R2-LoopBack0]quit
```

```
[Huawei]sysname R3
[R3]interface GigabitEthernet 0/0/0
[R3-GigabitEthernet0/0/0]ip address 10.0.13.3 24
[R3-GigabitEthernet0/0/0]quit
[R3]interface LoopBack 0
[R3-LoopBack0]ip address 10.0.3.3 24
[R3-LoopBack0]quit
[R3]interface LoopBack 2
```

```
[R3-LoopBack2]ip address 172.16.0.1 24 [R3-LoopBack2]quit
```

2. Настройка OSPF:

```
[R1]ospf 1 router-id 10.0.1.1

[R1-ospf-1]area 0

[R1-ospf-1-area-0.0.0.0]network 10.0.1.0 0.0.0.255

[R1-ospf-1-area-0.0.0.0]network 10.0.13.0 0.0.0.255

[R1-ospf-1-area-0.0.0.0]network 10.0.12.0 0.0.0.255
```

```
[R2]ospf 1 router-id 10.0.2.2
[R2-ospf-1]area 0
[R2-ospf-1-area-0.0.0.0]network 10.0.2.0 0.0.0.255
[R2-ospf-1-area-0.0.0.0]network 10.0.12.0 0.0.0.255

...
[R2-ospf-1-area-0.0.0.0]
Oct 23 2020 17:03:19-08:00 R2
%%01OSPF/4/NBR_CHANGE_E(1)[7]:Neighbor changes event: neighbor status changed. (ProcessId=256, NeighborAddress=1.12.0.10, Neighbor Event=LoadingDone, NeighborPreviousState=Loading, NeighborCurrentState=Full)
```

```
[R3]ospf 1 router-id 10.0.3.3
[R3-ospf-1]area 0
[R3-ospf-1-area-0.0.0.0]network 10.0.3.0 0.0.0.255
[R3-ospf-1-area-0.0.0.0]network 10.0.13.0 0.0.0.255

...
[R3-ospf-1-area-0.0.0.0]
Oct 23 2020 17:06:34-08:00 R3
%%010SPF/4/NBR_CHANGE_E(1)[5]:Neighbor changes eve
nt: neighbor status changed. (ProcessId=256,
NeighborAddress=1.13.0.10, Neighbor
Event=LoadingDone, NeighborPreviousState=Loading,
NeighborCurrentState=Full)
```

3. Проверки конфигурации OSPF

```
LoopBack0
     10.0.1.1/32 Direct 0
                                               127.0.0.1
LoopBack0
     10.0.1.255/32 Direct 0
                                0
                                               127.0.0.1
                                           D
LoopBack0
     10.0.2.2/32 OSPF
                           10
                                1
                                           D
                                               10.0.12.2
GigabitEthernet
0/0/1
     10.0.3.3/32 OSPF
                                               10.0.13.3
                           10
                                           D
GigabitEthernet
0/0/0
     10.0.12.0/24
                                               10.0.12.1
                   Direct
                            0
                                 0
                                           D
GigabitEthernet
0/0/1
     10.0.12.1/32
                   Direct
                                 0
                                           D
                                               127.0.0.1
GigabitEthernet
0/0/1
     10.0.12.255/32 Direct 0
                                               127.0.0.1
                                           D
GigabitEthernet
0/0/1
     10.0.13.0/24
                   Direct
                                 0
                                           D
                                               10.0.13.1
GigabitEthernet
0/0/0
     10.0.13.1/32
                   Direct
                                 0
                                           D
                                               127.0.0.1
GigabitEthernet
0/0/0
     10.0.13.255/32 Direct 0
                                               127.0.0.1
                                           D
GigabitEthernet
0/0/0
     127.0.0.0/8
                   Direct
                                           D
                                               127.0.0.1
InLoopBack0
     127.0.0.1/32 Direct
                           0
                                 0
                                           D
                                               127.0.0.1
InLoopBack0
127.255.255.255/32 Direct
                                           D
                                               127.0.0.1
InLoopBack0
255.255.255.255/32 Direct
                                               127.0.0.1
                           0
                                0
                                           D
InLoopBack0
<R1>display ospf peer
     OSPF Process 1 with Router ID 10.0.1.1
       Neighbors
Area 0.0.0.0 interface 10.0.12.1 (GigabitEthernet0/0/1) 's
neighbors
Router ID: 10.0.2.2
                           Address: 10.0.12.2
   State: Full Mode: Nbr is Master Priority: 1
   DR: 10.0.12.1 BDR: 10.0.12.2 MTU: 0
   Dead timer due in 37
   Retrans timer interval: 5
  Neighbor is up for 00:13:30
  Authentication Sequence: [ 0 ]
       Neighbors
 Area 0.0.0.0 interface 10.0.13.1(GigabitEthernet0/0/0)'s
```

```
neighbors
Router ID: 10.0.3.3 Address: 10.0.13.3
State: Full Mode:Nbr is Master Priority: 1
DR: 10.0.13.1 BDR: 10.0.13.3 MTU: 0
Dead timer due in 31 sec
Retrans timer interval: 5
Neighbor is up for 00:10:15
Authentication Sequence: [ 0 ]
```

<r2>display ip rout Route Flags: R - re</r2>	_		nload to fi	.b	
Routing Tables: Pub Destinations		Rout	es : 13		
Destination/Mask Interface	Proto) Pi	re Cost	Fla	gs NextHop
10.0.1.1/32 C GigabitEthernet 0/0/1	SPF	10	1	D	10.0.12.1
10.0.2.0/24 1 LoopBack0	Direct	0	0	D	10.0.2.2
10.0.2.2/32 I	Direct	0	0	D	127.0.0.1
10.0.2.255/32 LoopBack0	Direct	0	0	D	127.0.0.1
10.0.3.3/32	SPF	10	2	D	10.0.12.1
GigabitEthernet 0/0/1					
10.0.12.0/24 GigabitEthernet 0/0/1	Direct	0	0	D	10.0.12.2
10.0.12.2/32 GigabitEthernet	Direct	0	0	D	127.0.0.1
0/0/1 10.0.12.255/32 GigabitEthernet	2 Direc	et 0	0	D	127.0.0.1
0/0/1					
- · · · · · · · · · · · · · · · · · · ·	OSPF	10	2	D	10.0.12.1
GigabitEthernet 0/0/1					
127.0.0.0/8	Direct	0	0	D	127.0.0.1
InLoopBack0					
127.0.0.1/32	Direct	0	0	D	127.0.0.1
InLoopBack0 127.255.255.255/32 InLoopBack0	Direct	0	0	D	127.0.0.1
255.255.255.255/32 InLoopBack0	Direct	0	0	D	127.0.0.1
<r2>ping 10.0.1.1</r2>					

```
PING 10.0.1.1: 56 data bytes, press CTRL C to break
     Reply from 10.0.1.1: bytes=56 Sequence=1 ttl=255 time=30 ms
     Reply from 10.0.1.1: bytes=56 Sequence=2 ttl=255 time=40 ms
     Reply from 10.0.1.1: bytes=56 Sequence=3 ttl=255 time=30 ms
     Reply from 10.0.1.1: bytes=56 Sequence=4 ttl=255 time=30 ms
     Reply from 10.0.1.1: bytes=56 Sequence=5 ttl=255 time=20 ms
  --- 10.0.1.1 ping statistics ---
     5 packet(s) transmitted
     5 packet(s) received
     0.00% packet loss
     round-trip min/avg/max = 20/30/40 ms
<R2>display ospf peer brief
    OSPF Process 1 with Router ID 10.0.2.2
        Peer Statistic Information
Area Id Interface
                                              Neighbor id
State
0.0.0.0 GigabitEthernet0/0/1
                                              10.0.1.1
Full
```

<r3>display ip routing-t Route Flags: R - relay,</r3>		wnload to	o fib	
Routing Tables: Public Destinations: 16	Rou	tes : 16		
Destination/Mask Pro Interface	oto E	Pre Cost	Fla	ags NextHop
10.0.1.1/32 OSPF GigabitEthernet 0/0/0	10	1	D	10.0.13.1
10.0.2.2/32 OSPF	10	2	D	10.0.13.1
GigabitEthernet				
10.0.3.0/24 Direct	0	0	D	10.0.3.3
LoopBack0 10.0.3.3/32 Direct	- 0	0	D	127.0.0.1
LoopBack0		· ·	_	12/00/01
10.0.3.255/32 Dire	ect 0	0	D	127.0.0.1
LoopBack0				
10.0.12.0/24 OSPF	10	2	D	10.0.13.1
GigabitEthernet				
10.0.13.0/24 Direc	et 0	0	D	10.0.13.3

```
GigabitEthernet
0/0/0
    10.0.13.3/32 Direct 0 0
                               D 127.0.0.1
GigabitEthernet
0/0/0
    10.0.13.255/32 Direct 0 0
                                   D 127.0.0.1
GigabitEthernet
0/0/0
    127.0.0.0/8 Direct 0
                                   D 127.0.0.1
InLoopBack0
    127.0.0.1/32 Direct 0
                          Ω
                             D 127.0.0.1
InLoopBack0
127.255.255.255/32 Direct 0
                                   D 127.0.0.1
InLoopBack0
    172.16.0.0/24 Direct 0
                           0
                                   D
                                        172.16.0.1
LoopBack2
    172.16.0.1/32 Direct 0
                                   D 127.0.0.1
                           0
LoopBack2
  172.16.0.255/32 Direct 0
                                   D 127.0.0.1
                           0
LoopBack2
255.255.255.255/32 Direct 0 0
                             D 127.0.0.1
InLoopBack0
<R3>ping 10.0.3.3
 PING 10.0.3.3: 56 data bytes, press CTRL C to break
    Reply from 10.0.3.3: bytes=56 Sequence=1 ttl=255 time=10 ms
    Reply from 10.0.3.3: bytes=56 Sequence=2 ttl=255 time=1 ms
    Reply from 10.0.3.3: bytes=56 Sequence=3 ttl=255 time=1 ms
    Reply from 10.0.3.3: bytes=56 Sequence=4 ttl=255 time=1 ms
    Reply from 10.0.3.3: bytes=56 Sequence=5 ttl=255 time=1 ms
  --- 10.0.3.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 1/2/10 ms
<R3>display ospf peer brief
    OSPF Process 1 with Router ID 10.0.3.3
       Peer Statistic Information
  ______
_____
Area Id
            Interface
                                         Neighbor id
State
0.0.0.0 GigabitEthernet0/0/0
                                        10.0.1.1
Full
_____
```

4. Изменение интервала "Hello" и интервала "Dead" OSPF

```
<R1>display ospf interface GigabitEthernet 0/0/0
    OSPF Process 1 with Router ID 10.0.1.1
       Interfaces
Interface: 10.0.13.1 (GigabitEthernet0/0/0)
Cost: 1
               State: DR
                              Type: Broadcast MTU: 1500
Priority: 1
Designated Router: 10.0.13.1
Backup Designated Router: 10.0.13.3
Timers: Hello 10 , Dead 40 , Poll 120 , Retransmit 5 , Transmit
Delay 1
<R1>sys
[R1]interface GigabitEthernet 0/0/0
[R1-GigabitEthernet0/0/0]ospf timer hello 15
[R1-GigabitEthernet0/0/0]ospf timer dead 60
[R1-GigabitEthernet0/0/0]quit
<R1>display ospf interface GigabitEthernet 0/0/0
    OSPF Process 1 with Router ID 10.0.1.1
       Interfaces
Interface: 10.0.13.1 (GigabitEthernet0/0/0)
Cost: 1
               State: DR Type: Broadcast MTU: 1500
Priority: 1
Designated Router: 10.0.13.1
Backup Designated Router: 0.0.0.0
Timers: Hello 15 , Dead 60 , Poll 120 , Retransmit 5 , Transmit
Delay 1
```

```
<R3>sys
[R3]interface GigabitEthernet 0/0/0
[R3-GigabitEthernet0/0/0]ospf timer hello 15
[R3-GigabitEthernet0/0/0]ospf timer dead 60
[R3-GigabitEthernet0/0/0]quit
Oct 23 2020 17:52:37-08:00 R3
%%010SPF/4/NBR CHANGE E(1)[4]:Neighbor changes eve
nt: neighbor status changed. (ProcessId=256,
NeighborAddress=1.13.0.10, Neighbor
Event=LoadingDone, NeighborPreviousState=Loading,
NeighborCurrentState=Full)
[R3]display ospf interface GigabitEthernet 0/0/0
     OSPF Process 1 with Router ID 10.0.3.3
       Interfaces
 Interface: 10.0.13.3 (GigabitEthernet0/0/0)
 Cost: 1
                State: DR
                            Type: Broadcast MTU: 1500
```

Priority: 1
Designated Router: 10.0.13.3
Backup Designated Router: 10.0.13.1
Timers: Hello 15 , Dead 60 , Poll 120 , Retransmit 5 , Transmit Delay 1

5. Объявление статических маршрутов по умолчанию

```
[R3]ip route-static 0.0.0.0 0.0.0.0 LoopBack 2
[R3]ospf 1
[R3-ospf-1]default-route-advertise
<R3>display ip routing-table
Route Flags: R - relay, D - download to fib
Routing Tables: Public
   Destinations: 17 Routes: 17
Destination/Mask Proto Pre Cost Flags NextHop
Interface
    0.0.0.0/0 Static 60 0
                          D 172.16.0.1
LoopBack2
    10.0.1.1/32 OSPF 10 1 D 10.0.13.1
GigabitEthernet
0/0/0
    10.0.2.2/32 OSPF 10 2
                                 D 10.0.13.1
GigabitEthernet
0/0/0
    10.0.3.0/24 Direct 0 0
                                D 10.0.3.3
LoopBack0
    10.0.3.3/32 Direct 0 0 D 127.0.0.1
LoopBack0
    10.0.3.255/32 Direct 0 0 D 127.0.0.1
LoopBack0
   10.0.12.0/24 OSPF 10 2
                                D 10.0.13.1
GigabitEthernet
0/0/0
```

```
0/0/0
    10.0.1.0/24 Direct 0 0 D 10.0.1.1
LoopBack0
    10.0.1.1/32 Direct 0 0 D 127.0.0.1
LoopBack0
    10.0.1.255/32 Direct 0
                        0
                                 D 127.0.0.1
LoopBack0
    10.0.2.2/32 OSPF 10 1
                                 D 10.0.12.2
GigabitEthernet
0/0/1
    10.0.3.3/32 OSPF 10 1 D 10.0.13.3
GigabitEthernet
0/0/0
```

```
<R2>display ip routing-table
Route Flags: R - relay, D - download to fib
Routing Tables: Public
    Destinations: 14 Routes: 14
Destination/Mask Proto Pre Cost Flags NextHop
Interface
     0.0.0.0/0 O ASE 150 1
                                      D 10.0.12.1
GigabitEthernet
0/0/1
     10.0.1.1/32 OSPF 10 1
                                      D 10.0.12.1
GigabitEthernet
0/0/1
     10.0.2.0/24 Direct 0 0
                                      D 10.0.2.2
LoopBack0
     10.0.2.2/32 Direct 0 0 D 127.0.0.1
LoopBack0
     10.0.2.255/32 Direct 0 0 D 127.0.0.1
LoopBack0
<R2>ping 172.16.0.1
 PING 172.16.0.1: 56 data bytes, press CTRL C to break
     Reply from 172.16.0.1: bytes=56 Sequence=1 ttl=254 time=40
ms
     Reply from 172.16.0.1: bytes=56 Sequence=2 ttl=254 time=30
ms
    Reply from 172.16.0.1: bytes=56 Sequence=3 ttl=254 time=10
ms
     Reply from 172.16.0.1: bytes=56 Sequence=4 ttl=254 time=30
ms
     Reply from 172.16.0.1: bytes=56 Sequence=5 ttl=254 time=30
ms
  --- 172.16.0.1 ping statistics ---
     5 packet(s) transmitted
```

```
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 10/28/40 ms
```

6. Управление выбором DR и BDR

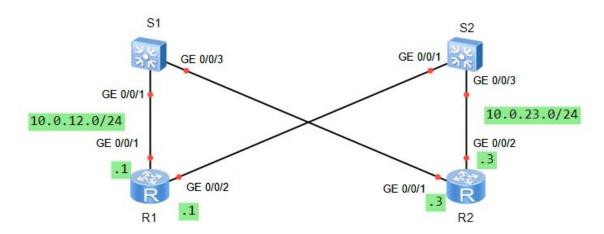
```
<R1>display ospf peer 10.0.3.3
     OSPF Process 1 with Router ID 10.0.1.1
       Neighbors
 Area 0.0.0.0 interface 10.0.13.1(GigabitEthernet0/0/0)'s
neighbors
Router ID: 10.0.3.3
                          Address: 10.0.13.3
   State: Full Mode: Nbr is Master Priority: 1
   DR: 10.0.13.3 BDR: 10.0.13.1 MTU: 0
   Dead timer due in 48 sec
   Retrans timer interval: 5
   Neighbor is up for 00:20:44
   Authentication Sequence: [ 0 ]
<R1>sys
[R1]interface GigabitEthernet 0/0/0
[R1-GigabitEthernet0/0/0]ospf dr-pr
[R1-GigabitEthernet0/0/0]ospf dr-priority 200
[R1-GigabitEthernet0/0/0] shutdown
[R1-GigabitEthernet0/0/0]undo shutdown
[R1-GigabitEthernet0/0/0]display ospf peer 10.0.3.3
     OSPF Process 1 with Router ID 10.0.1.1
       Neighbors
 Area 0.0.0.0 interface 10.0.13.1(GigabitEthernet0/0/0)'s
neighbors
Router ID: 10.0.3.3
                          Address: 10.0.13.3
   State: Full Mode: Nbr is Master Priority: 100
   DR: 10.0.13.1 BDR: 10.0.13.3 MTU: 0
   Dead timer due in 51 sec
   Retrans timer interval: 5
   Neighbor is up for 00:00:38
   Authentication Sequence: [ 0 ]
```

```
R3-GigabitEthernet0/0/0]ospf dr-pri
[R3-GigabitEthernet0/0/0]ospf dr-priority 100
[R3-GigabitEthernet0/0/0]shutdown

[R3-GigabitEthernet0/0/0]undo shutdown
```

Задание 5.2

Реализованная топология:



1. Настройка устройств:

```
<Huawei>sys
[Huawei]sysname R1
[R1]int gi0/0/1
[R1-GigabitEthernet0/0/1]ip address 10.0.12.1 24
[R1-GigabitEthernet0/0/1]quit
[Huawei]sysname R3
[R3]int gi0/0/1
[R3-GigabitEthernet0/0/1]ip address 10.0.12.3 24
[R3-GigabitEthernet0/0/1] shutdown
[R3-GigabitEthernet0/0/1]
[R3-GigabitEthernet0/0/1]
[R3-GigabitEthernet0/0/1]quit
[R3]int gi0/0/2
[R3-GigabitEthernet0/0/2]ip address 10.0.23.3 24
[R3-GigabitEthernet0/0/2]
[R3-GigabitEthernet0/0/2]quit
<Huawei>sys
[Huawei]sysname S1
<Huawei>sys
[Huawei]sysname S2
```

3. Дополнительная конфигурация:

```
[S1]int gi0/0/9
[S1-GigabitEthernet0/0/9]shutdown
[S1-GigabitEthernet0/0/9]quit

[S1]int gi0/0/10
[S1-GigabitEthernet0/0/10]shutdown
[S1-GigabitEthernet0/0/10]quit
```

[S1]int gi0/0/13 [S1-GigabitEthernet0/0/13]: [S1-GigabitEthernet0/0/13]		√n			
[S1]int gi0/0/14 [S1-GigabitEthernet0/0/14]: [S1-GigabitEthernet0/0/14]:		vn			
[S2]int gi0/0/9 [S2-GigabitEthernet0/0/9]sl [S2-GigabitEthernet0/0/9]qu		1			
[S2]int gi0/0/10 [S2-GigabitEthernet0/0/10]: [S2-GigabitEthernet0/0/10]		<i>i</i> n			
[S2]int gi0/0/7 [S2-GigabitEthernet0/0/7]sl [S2-GigabitEthernet0/0/7]qu		1			
[S2]int gi0/0/6 [S2-GigabitEthernet0/0/6]sl [S2-GigabitEthernet0/0/6]qu		n			
[R1]int gi0/0/2 [R1-GigabitEthernet0/0/2]ip [R1-GigabitEthernet0/0/2]sl			3.1 24		
[S1]disp int brief					
 Interface	PHY	Protocol	InUti	OutUti	
<pre>inErrors outErrors GigabitEthernet0/0/1 0 0</pre>	up	up	0%	0%	
GigabitEthernet0/0/2 0 0	down	down	0%	0%	
GigabitEthernet0/0/3 0 0	down	down	0%	0%	
GigabitEthernet0/0/4 0 0	down	down	0%	0%	
GigabitEthernet0/0/5 0 0	down	down	0%	0%	
GigabitEthernet0/0/6	down	down	0%	0%	
GigabitEthernet0/0/7 0 0	down	down	0%	0%	
GigabitEthernet0/0/8	down	down	0 응	0%	
1					
GigabitEthernet0/0/9	*down	down	0%	0%	0
_	*down		0% 0%	0% 0%	0

0 0					
GigabitEthernet0/0/12	down	down	0%	0%	
0 0					
GigabitEthernet0/0/13	*down	down	0%	0%	0
0		_			
GigabitEthernet0/0/14	*down	down	0%	0%	0
0					
[COldian int briat					
[S2]disp int brief					
Interface	PHY	Protocol	TnII+i	O11+11+i	
inErrors outErrors	FIII	FIOCOCOI	1110 C1	Outoti	
GigabitEthernet0/0/1	down	down	0%	0%	
0 0	aowii	aowii	0 0	0 0	
GigabitEthernet0/0/2	down	down	0%	0%	
0 0	0.0	0.0	0 0	0 0	
GigabitEthernet0/0/3	up	up	0%	0%	
0 0		1-			
GigabitEthernet0/0/4	down	down	0%	0%	
0 0					
GigabitEthernet0/0/5	down	down	0%	0%	
0 0					
GigabitEthernet0/0/6	*down	down	0%	0%	0
0					
GigabitEthernet0/0/7	*down	down	0%	0%	0
0					
GigabitEthernet0/0/8	down	down	0%	0%	
0 0					
GigabitEthernet0/0/9	*down	down	0%	0%	0
0		_			
GigabitEthernet0/0/10	*down	down	0%	0%	0
0					
[D1] dien in int brief					
[R1]disp ip int brief					
Interface		IP Addre	aa/Maak	Dhac	ical
Protocol		II Addle	33/Mask	riiys	ıcaı
GigabitEthernet0/0/0		unassign	ed	down	
down		anabbigin	<u> </u>	ac wii	
GigabitEthernet0/0/1		10.0.12.	1/24	up	
up			· -	T-	
GigabitEthernet0/0/2		10.0.23.1	/24	*down	
down					
NULL0		unassign	ed	up	
up(s)		_		_	
<r3>disp ip int brief</r3>					
Interface		IP Addre	ss/Mask	Phys	ical
Protocol			_		
GigabitEthernet0/0/0		unassign	ed	down	
down					

10.0.23.3/24	up
unassigned	up

4. Включение DHCP:

```
[R1]dhcp enable [R3]dhcp enable
```

5. Создание глобального пула ІР-адресов

```
[R1]ip pool pool1
Info: It's successful to create an IP address pool.
[R1-ip-pool-pool1]network 10.0.12.0 mask 24
[R1-ip-pool-pool1]gateway-list 10.0.12.1
[R1-ip-pool-pool1]lease day 1 hour 12
[R1-ip-pool-pool1]quit
[R1]int gi0/0/1
[R1-GigabitEthernet0/0/1]dhcp select global
[R1-GigabitEthernet0/0/1]quit
[R3]ip pool pool2
Info: It's successful to create an IP address pool.
[R3-ip-pool-pool2]network 10.0.23.0 mask 24
[R3-ip-pool-pool2]gateway-list 10.0.23.3
[R3-ip-pool-pool2]lease day 1 hour 12
[R3-ip-pool-pool2]int gi0/0/2
[R3-GigabitEthernet0/0/2]dhcp select global
[R3-GigabitEthernet0/0/2]quit
[R1] disp ip pool name pool1
 Pool-name : pool1
 Pool-No
               : 0
 Lease
              : 1 Days 12 Hours 0 Minutes
 Domain-name
 DNS-server0
 NBNS-server0
 Netbios-type
                            Status : Unlocked
 Position
               : Local
 Gateway-0
               : 10.0.12.1
               : 255.255.255.0
 Mask
 VPN instance : --
       Start
                      End Total Used Idle(Expired)
Conflict Disable
```

```
10.0.12.1 10.0.12.254 253 0 253(0)
       0
[S1]dhcp enable
[S1]int Vlanif 1
[S1-Vlanif1]ip addr dhcp-alloc
[S1-Vlanif1] disp ip int brief
                             IP Address/Mask
Interface
                                               Physical
Protocol
MEth0/0/1
                             unassigned
                                                down
down
NULL0
                             unassigned
                                               up
up(s)
                          10.0.12.254/24 up
Vlanif1
up
[S2]dhcp enable
[S2]int Vlanif 1
[S2-Vlanif1]ip addr dhcp-alloc
[S2-Vlanif1] disp ip int brief
... •
Interface
                           IP Address/Mask Physical
Protocol
MEth0/0/1
                             unassigned
                                         down
down
NULL0
                             unassigned
                                                up
up(s)
                             10.0.23.254/24
Vlanif1
                                              up
<R1>disp ip pool name pool1
 Pool-name : pool1
 Pool-No
              : 0
            : 1 Days 12 Hours 0 Minutes
 Lease
 Domain-name : -
DNS-server0 : -
 NBNS-server0
 Netbios-type
                          Status : Unlocked
 Position
              : Local
              : 10.0.12.1
 Gateway-0
 Mask
              : 255.255.255.0
 VPN instance : --
       Start
                    End Total Used Idle(Expired)
Conflict Disable
```

```
10.0.12.1 10.0.12.254 253 1 252(0)
     0
<R3>disp ip pool name pool2
 Pool-name : pool2
NBNS-server0
 Netbios-type
          : Local Status : Unlocked : 10.0.23.3
 Position : Local
 Gateway-0
 Mask
           : 255.255.255.0
 VPN instance : --
     Start
                End Total Used Idle(Expired)
Conflict Disable
    10.0.23.1 10.0.23.254 253 1 252(0)
    0
```

6. Создание пула ІР-адресов на основе интерфейса:

```
[R1]int gi0/0/1
[R1-GigabitEthernet0/0/1]shutdown

[R3]int gi0/0/2
[R3-GigabitEthernet0/0/2]shutdown

[R1]int gi0/0/2
[R1-GigabitEthernet0/0/2]dhcp select interface

[R3]int gi0/0/1
[R3-GigabitEthernet0/0/1]dhcp select interface

[R1-GigabitEthernet0/0/2]dhcp server dns-list 10.0.23.254
[R1-GigabitEthernet0/0/2]dhcp server excluded-ip-address 10.0.23.254
[R1-GigabitEthernet0/0/2]dhcp server lease day 1 hour 12

[R3-GigabitEthernet0/0/1]dhcp server dns-list 10.0.12.254
```

```
[R3-GigabitEthernet0/0/1]dhcp server excluded-ip-address
10.0.12.254
[R3-GigabitEthernet0/0/1]dhcp server lease day 1 hour 12
[R1-GigabitEthernet0/0/2]display ip pool interface
GigabitEthernet0/0/2
 Pool-name : GigabitEthernet0/0/2
 Pool-No : 1
Lease : 1 Days 12 Hours 0 Minutes
Domain-name : -
DNS-server0 : 10.0.23.254
 NBNS-server0 : -
 Netbios-type
                : -
                : Interface Status : Unlocked
 Position
 Gateway-0 : 10.0.23.1
Mask : 255.255.255.0
 VPN instance : --
                 End Total Used Idle(Expired)
        Start
Conflict Disable
    10.0.23.1 10.0.23.254 253 0 252(0)
1
[S2]int Vlanif 1
[S2-Vlanif1]shutdown
[S2-Vlanif1]undo shutdown
[R1]int qi0/0/2
[R1-GigabitEthernet0/0/2]undo shutdown
[R1-GigabitEthernet0/0/2]disp ip pool interface
GigabitEthernet0/0/2
 Pool-name : GigabitEthernet0/0/2
 Pool-No : 1
Lease : 1 Days 12 Hours 0 Minutes
 Domain-name : -

DNS-server0 : 10.0.23.254

NBNS-server0 : -
 Netbios-type : -
                : Interface Status : Unlocked
 Position
 Gateway-0 : 10.0.23.1
Mask : 255.255.25
                : 255.255.255.0
 VPN instance : --
```

Conflic	Start t Disabl		d '	Total	Used		(Expired)	
)	10.0.23.1	10.0.2	3.254	253	1		251(0)	
[S2-Vla	nif1]disp	ip int bri	ef					
interfa				IP Ad	dress/	Mask	Physi	ical
Protoco MEth0/0				unass	igned		down	
lown IULL0				unass	igned		up	
p(s) lanif1	o(s)			10.0.23.253/24			up	
S1-Vla S1-Vla R3]int R3-Gig		shutdown net0/0/1]un						
S1-Vla S1-Vla R3]int R3-Gig R3-Gig Pool- Pool- Lease	nif1]shut nif1]undo gi0/0/1 gabitEther gabitEther name	shutdown	sp ip j	pool i t0/0/1		abitEt	thernet0/()/1
S1-Vla [S1-Vla [R3]int [R3-Gig Pool-Pool-Lease Domai DNS-S NBNS-	nif1]shut nif1]undo gi0/0/1 gabitEther gabitEther name No e n-name server0	shutdown net0/0/1]un net0/0/1]di : GigabitE : 1 : 1 Days 1 : - : 10.0.12.	sp ip therne	pool i t0/0/1		abitEt	thernet0/()/1
S1-Vla S1-Vla R3-Vla R3-Gig R3-Gig Pool- Pool- Lease Domai DNS-s NBNS- Netbi Posit Gatew Mask	anif1]shut anif1]undo gi0/0/1 gabitEther gabitEther name No e an-name server0 server0 server0 sos-type sion	shutdown net0/0/1]un net0/0/1]di : GigabitE : 1 : 1 Days 1 : - : 10.0.12. : - : Interfac : 10.0.12.	sp ip ptherned 2 Hour 254	pool i t0/0/1 s 0 Mi	nutes	abitEt	chernet0/0	
[S1-Vla [S1-Vla [R3-Vla [R3-Gig Pool-Pool-Lease Domai DNS-S NBNS-Netbi Posit Gatew Mask VPN i	nif1]shut nif1]undo gi0/0/1 gabitEther gabitEther name No e n-name server0 server0 os-type sion	shutdown net0/0/1]un net0/0/1]di : GigabitE : 1 : 1 Days 1 : - : 10.0.12. : - : - : Interfac : 10.0.12. : 255.255. :	sp ip patherned 2 Hours 254 e 3 255.0	pool i t0/0/1 s 0 Mi Stat	nutes us			

IP Address/Mask	Physical
unassigned	down
unassigned	up
10.0.12.253/24	up
	unassigned