

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ РФ

Федеральное государственное автономное
образовательное учреждение высшего образования
«Национальный исследовательский университет ИТМО»
Факультет программной инженерии и компьютерной техники

Администрирование систем и сетей
Лабораторная работа №2

Студенты:

Погрибняк Иван Сергеевич
Бугаев Сергей Юрьевич

Преподаватель:

Афанасьев Дмитрий Борисович



Санкт-Петербург

2024

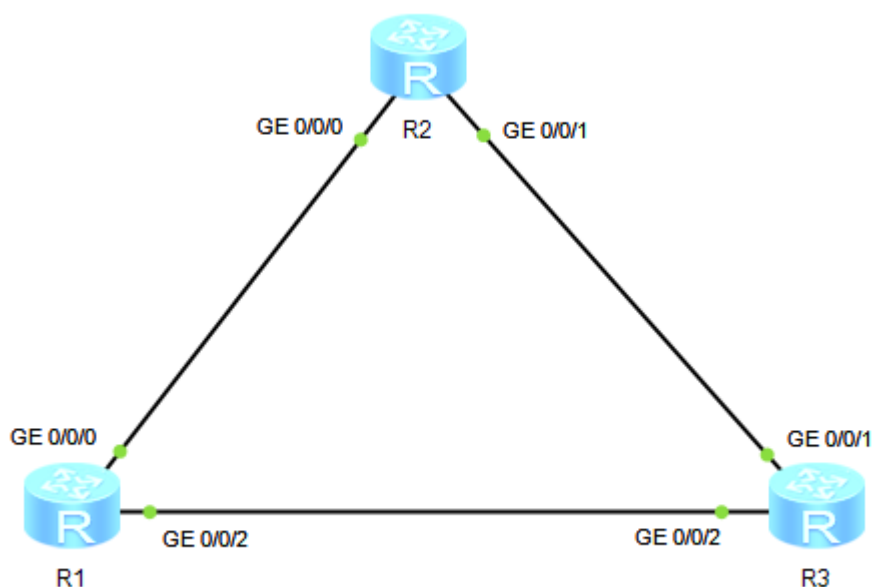
Цель работы.....	3
Топология сети.....	3
План работы.....	3
Конфигурация оборудования.....	4
Вывод IP-адреса текущего интерфейса и таблицы маршрутизации маршрутизатора.....	4
Вывод таблицы маршрутизации для маршрутизатора r1.....	4
Настройка IP-адресов для физических интерфейсов.....	4
Процесс конфигурации оборудования.....	5
r1.....	5
r2.....	5
r3.....	5
Проверка наличия связи.....	6
r1-r2.....	6
r1-r3.....	6
Таблица маршрутизации.....	6
Создание loopback-интерфейсов.....	7
Таблица маршрутизации для r1.....	7
Настройка статических маршрутов.....	8
Создание резервных маршрутов.....	11
Выключение интерфейса для активации резервного маршрута.....	12
Включение интерфейса и удаление настроенных маршрутов.....	14
Настройка маршрута по умолчанию.....	14
Конфигурационные файлы.....	15
Вывод.....	17

Цель работы

Получить практические в следующих темах:

- Процедура настройки IPv4-адреса на интерфейсе
- Функции и значение loopback-интерфейсов
- Принципы генерирования прямых маршрутов
- Процедура настройки статических маршрутов и условия, при которых используются статические маршруты
- Процедура проверки возможности установления соединения сетевого уровня с помощью инструмента ping
- Процедура настройки статических маршрутов и сценарии их применения

Топология сети



План работы

- Настроить IP-адресов для интерфейсов на маршрутизаторах
- Настройка статических маршрутов для установления связи между маршрутизаторами

Конфигурация оборудования

Вывод IP-адреса текущего интерфейса и таблицы маршрутизации маршрутизатора

```
<r1>system-view
Enter system view, return user view with Ctrl+Z.
[r1]display ip int brief
*down: administratively down
^down: standby
(1): loopback
(s): spoofing
The number of interface that is UP in Physical is 3
The number of interface that is DOWN in Physical is 1
The number of interface that is UP in Protocol is 1
The number of interface that is DOWN in Protocol is 3
```

Interface	IP Address/Mask	Physical	Protocol
GigabitEthernet0/0/0	unassigned	up	down
GigabitEthernet0/0/1	unassigned	down	down
GigabitEthernet0/0/2	unassigned	up	down
NULL0	unassigned	up	up(s)

Вывод таблицы маршрутизации для маршрутизатора r1

```
[r1]display ip routing-table
Route Flags: R - relay, D - download to fib
```

Routing Tables: Public

Destinations : 4 Routes : 4

Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
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	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0

Настройка IP-адресов для физических интерфейсов

Маршрутизатор	Интерфейс	IP-адрес/маска
R1	GigabitEthernet0/0/2	10.0.13.1/24
	GigabitEthernet0/0/0	10.0.12.1/24
R2	GigabitEthernet0/0/0	10.0.12.2/24
	GigabitEthernet0/0/1	10.0.23.2/24
R3	GigabitEthernet0/0/2	10.0.13.3/24
	GigabitEthernet0/0/1	10.0.23.3/24

Процесс конфигурации оборудования

r1

```
<r1>system-view
Enter system view, return user view with Ctrl+Z.
[r1]int g0/0/2
[r1-GigabitEthernet0/0/2]ip address 10.0.13.1 24
Oct 28 2024 03:35:01-08:00 r1 %%01IFNET/4/LINK_STATE(1)[6]:The line protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
[r1-GigabitEthernet0/0/2]int g0/0/0
[r1-GigabitEthernet0/0/0]ip address 10.0.12.1 24
[r1-GigabitEthernet0/0/0]
Oct 28 2024 03:36:08-08:00 r1 %%01IFNET/4/LINK_STATE(1)[7]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[r1-GigabitEthernet0/0/0]quit
```

r2

```
<r2>system-view
Enter system view, return user view with Ctrl+Z.
[r2]int g0/0/0
[r2-GigabitEthernet0/0/0]ip address 10.0.12.2 24
Oct 28 2024 03:37:51-08:00 r2 %%01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[r2-GigabitEthernet0/0/0]int g0/0/1
[r2-GigabitEthernet0/0/1]ip address 10.0.23.2 24
Oct 28 2024 03:38:41-08:00 r2 %%01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
```

r3

```
<r3>system-view
Enter system view, return user view with Ctrl+Z.
[r3]int g0/0/2
[r3-GigabitEthernet0/0/2]ip address 10.0.13.3 24
Oct 28 2024 03:40:14-08:00 r3 %%01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
[r3-GigabitEthernet0/0/2]int g0/0/1
[r3-GigabitEthernet0/0/1]ip address 10.0.23.3 24
Oct 28 2024 03:40:35-08:00 r3 %%01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
```

Проверка наличия связи

r1-r2

```
<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=80 ms
  Reply from 10.0.12.2: bytes=56 Sequence=2 ttl=255 time=20 ms
  Reply from 10.0.12.2: bytes=56 Sequence=3 ttl=255 time=10 ms
  Reply from 10.0.12.2: bytes=56 Sequence=4 ttl=255 time=20 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 = 10/30/80 ms
```

r1-r3

```
<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=50 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=20 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=10 ms

--- 10.0.13.3 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 10/26/50 ms
```

Таблица маршрутизации

```
<r1>display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
      Destinations : 10          Routes : 10

Destination/Mask    Proto    Pre  Cost    Flags NextHop          Interface
10.0.12.0/24        Direct   0     0        D   10.0.12.1          GigabitEthernet
0/0/0
10.0.12.1/32        Direct   0     0        D   127.0.0.1          GigabitEthernet
0/0/0
10.0.12.255/32      Direct   0     0        D   127.0.0.1          GigabitEthernet
0/0/0
```

10.0.13.0/24	Direct	0	0	D	10.0.13.1	GigabitEthernet
0/0/2						
10.0.13.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
10.0.13.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
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	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0

Создание loopback-интерфейсов

Маршрутизатор	Интерфейс	IP-адрес/маска
R1	LoopBack0	10.0.1.1/32
R2	LoopBack0	10.0.1.2/32
R3	LoopBack0	10.0.1.3/32

r1

```
<r1>system-view
Enter system view, return user view with Ctrl+Z.
[r1]int LoopBack0
[r1-LoopBack0]ip address 10.0.1.1 32
```

r2

```
<r2>system-view
Enter system view, return user view with Ctrl+Z.
[r2]int LoopBack0
[r2-LoopBack0]ip address 10.0.1.2 32
```

r3

```
<r3>system-view
Enter system view, return user view with Ctrl+Z.
[r3]int LoopBack0
[r3-LoopBack0]ip address 10.0.1.3 32
```

Таблица маршрутизации для r1

```
<r1>display 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
10.0.1.1/32	Direct	0	0	D	127.0.0.1	LoopBack0
10.0.12.0/24	Direct	0	0	D	10.0.12.1	GigabitEthernet
0/0/0						
10.0.12.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.12.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.13.0/24	Direct	0	0	D	10.0.13.1	GigabitEthernet
0/0/2						
10.0.13.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
10.0.13.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
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	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0

<r1>ping -a 10.0.1.1 10.0.1.2

PING 10.0.1.2: 56 data bytes, press CTRL_C to break

Request time out

Request time out

Request time out

Request time out

Request time out

--- 10.0.1.2 ping statistics ---

5 packet(s) transmitted

0 packet(s) received

100.00% packet loss

Настройка статических маршрутов

<r1>system-view

Enter system view, return user view with Ctrl+Z.

[r1]ip route-static 10.0.1.2 32 10.0.12.2

[r1]ip route-static 10.0.1.3 32 10.0.13.3

[r1]display ip routing-table

Route Flags: R - relay, D - download to fib

Routing Tables: Public

Destinations : 13 Routes : 13

Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
------------------	-------	-----	------	-------	---------	-----------

	10.0.1.1/32	Direct	0	0	D	127.0.0.1	LoopBack0
	10.0.1.2/32	Static	60	0	RD	10.0.12.2	GigabitEthernet
0/0/0							
	10.0.1.3/32	Static	60	0	RD	10.0.13.3	GigabitEthernet
0/0/2							
	10.0.12.0/24	Direct	0	0	D	10.0.12.1	GigabitEthernet
0/0/0							
	10.0.12.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0							
	10.0.12.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0							
	10.0.13.0/24	Direct	0	0	D	10.0.13.1	GigabitEthernet
0/0/2							
	10.0.13.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2							
	10.0.13.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2							
	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	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32		Direct	0	0	D	127.0.0.1	InLoopBack0

[r1]ping -a 10.0.1.1 10.0.1.2

PING 10.0.1.2: 56 data bytes, press CTRL_C to break

Request time out
Request time out
Request time out
Request time out
Request time out

--- 10.0.1.2 ping statistics ---

5 packet(s) transmitted
0 packet(s) received
100.00% packet loss

r2

[r2]ip route-static 10.0.1.1 32 10.0.12.1

r1

[r1]ping -a 10.0.1.1 10.0.1.2

PING 10.0.1.2: 56 data bytes, press CTRL_C to break

Reply from 10.0.1.2: bytes=56 Sequence=1 ttl=255 time=20 ms
Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=255 time=20 ms
Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=20 ms
Reply from 10.0.1.2: bytes=56 Sequence=4 ttl=255 time=20 ms
Reply from 10.0.1.2: bytes=56 Sequence=5 ttl=255 time=20 ms

--- 10.0.1.2 ping statistics ---

5 packet(s) transmitted
5 packet(s) received
0.00% packet loss

round-trip min/avg/max = 20/20/20 ms

r2

[r2]ip route-static 10.0.1.1 32 10.0.12.1

[r2]ip route-static 10.0.1.3 32 10.0.23.3

r3

[r3]ip route-static 10.0.1.1 32 10.0.13.1

[r3]ip route-static 10.0.1.2 32 10.0.23.2

r2

[r2]ping -a 10.0.1.2 10.0.1.3

PING 10.0.1.3: 56 data bytes, press CTRL_C to break

Reply from 10.0.1.3: bytes=56 Sequence=1 ttl=255 time=20 ms

Reply from 10.0.1.3: bytes=56 Sequence=2 ttl=255 time=30 ms

Reply from 10.0.1.3: bytes=56 Sequence=3 ttl=255 time=20 ms

Reply from 10.0.1.3: bytes=56 Sequence=4 ttl=255 time=20 ms

Reply from 10.0.1.3: bytes=56 Sequence=5 ttl=255 time=20 ms

--- 10.0.1.3 ping statistics ---

5 packet(s) transmitted

5 packet(s) received

0.00% packet loss

round-trip min/avg/max = 20/22/30 ms

r3

[r3]ping -a 10.0.1.3 10.0.1.2

PING 10.0.1.2: 56 data bytes, press CTRL_C to break

Reply from 10.0.1.2: bytes=56 Sequence=1 ttl=255 time=30 ms

Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=255 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=4 ttl=255 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=5 ttl=255 time=20 ms

--- 10.0.1.2 ping statistics ---

5 packet(s) transmitted

5 packet(s) received

0.00% packet loss

round-trip min/avg/max = 20/22/30 ms

Создание резервных маршрутов

r1

[r1]ip route-static 10.0.1.2 32 10.0.13.3 preference 100

r2

[r2]ip route-static 10.0.1.1 32 10.0.23.3 preference 100

r1

[r1]display ip routing-table

Route Flags: R - relay, D - download to fib

 Routing Tables: Public

Destinations : 13 Routes : 13

Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
10.0.1.1/32	Direct	0	0	D	127.0.0.1	LoopBack0
10.0.1.2/32	Static	60	0	RD	10.0.12.2	GigabitEthernet
0/0/0						
10.0.1.3/32	Static	60	0	RD	10.0.13.3	GigabitEthernet
0/0/2						
10.0.12.0/24	Direct	0	0	D	10.0.12.1	GigabitEthernet
0/0/0						
10.0.12.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.12.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.13.0/24	Direct	0	0	D	10.0.13.1	GigabitEthernet
0/0/2						
10.0.13.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
10.0.13.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
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	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0

r2

[r2]display ip routing-table

Route Flags: R - relay, D - download to fib

 Routing Tables: Public

Destinations : 13 Routes : 13

Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
10.0.1.1/32	Static	60	0	RD	10.0.12.1	GigabitEthernet
0/0/0						
10.0.1.2/32	Direct	0	0	D	127.0.0.1	LoopBack0
10.0.1.3/32	Static	60	0	RD	10.0.23.3	GigabitEthernet
0/0/1						
10.0.12.0/24	Direct	0	0	D	10.0.12.2	GigabitEthernet
0/0/0						
10.0.12.2/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.12.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.23.0/24	Direct	0	0	D	10.0.23.2	GigabitEthernet
0/0/1						
10.0.23.2/32	Direct	0	0	D	127.0.0.1	GigabitEthernet

```

0/0/1
  10.0.23.255/32 Direct 0 0 D 127.0.0.1 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 Direct 0 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0

```

Выключение интерфейса для активации резервного маршрута

```

r1
[r1]int g0/0/0
[r1-GigabitEthernet0/0/0]shutdown
Oct 28 2024 04:07:54-08:00 r1 %%01IFPDT/4/IF_STATE(1)[0]:Interface GigabitEthernet0/0/0 has turned into DOWN state.

```

```

[r1]display ip routing-table
Route Flags: R - relay, D - download to fib

```

```

-----
Routing Tables: Public
    Destinations : 10          Routes : 10

Destination/Mask    Proto    Pre  Cost           Flags NextHop          Interface
-----
      10.0.1.1/32    Direct   0    0              D   127.0.0.1          LoopBack0
      10.0.1.2/32    Static  100    0             RD   10.0.13.3          GigabitEthernet
0/0/2
      10.0.1.3/32    Static   60    0             RD   10.0.13.3          GigabitEthernet
0/0/2
      10.0.13.0/24   Direct   0    0              D   10.0.13.1          GigabitEthernet
0/0/2
      10.0.13.1/32   Direct   0    0              D   127.0.0.1          GigabitEthernet
0/0/2
      10.0.13.255/32 Direct   0    0              D   127.0.0.1          GigabitEthernet
0/0/2
      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    0              D   127.0.0.1          InLoopBack0
255.255.255.255/32 Direct   0    0              D   127.0.0.1          InLoopBack0

```

```

r2
[r2]display ip routing-table
Route Flags: R - relay, D - download to fib

```

```

-----
Routing Tables: Public
    Destinations : 10          Routes : 10

Destination/Mask    Proto    Pre  Cost           Flags NextHop          Interface
-----
      10.0.1.1/32    Static  100    0             RD   10.0.23.3          GigabitEthernet
0/0/1

```

10.0.1.2/32	Direct	0	0	D	127.0.0.1	LoopBack0
10.0.1.3/32	Static	60	0	RD	10.0.23.3	GigabitEthernet
0/0/1						
10.0.23.0/24	Direct	0	0	D	10.0.23.2	GigabitEthernet
0/0/1						
10.0.23.2/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/1						
10.0.23.255/32	Direct	0	0	D	127.0.0.1	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	Direct	0	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0

r1

[r1]ping -a 10.0.1.1 10.0.1.2

PING 10.0.1.2: 56 data bytes, press CTRL_C to break

Reply from 10.0.1.2: bytes=56 Sequence=1 ttl=254 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=254 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=254 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=4 ttl=254 time=20 ms

Reply from 10.0.1.2: bytes=56 Sequence=5 ttl=254 time=20 ms

--- 10.0.1.2 ping statistics ---

5 packet(s) transmitted

5 packet(s) received

0.00% packet loss

round-trip min/avg/max = 20/20/20 ms

[r1]tracert -a 10.0.1.1 10.0.1.2

tracert to 10.0.1.2(10.0.1.2), max hops: 30 ,packet length: 40,press CTRL_C to break

1 10.0.13.3 30 ms 20 ms 20 ms

2 10.0.23.2 30 ms 30 ms 20 ms

Включение интерфейса и удаление настроенных маршрутов

r1

[r1]int g0/0/0

[r1-GigabitEthernet0/0/0]undo shutdown

[r1-GigabitEthernet0/0/0]

Oct 28 2024 04:11:32-08:00 r1 %%01IFPDT/4/IF_STATE(1)[2]:Interface GigabitEthernet0/0/0 has turned into UP state.

[r1]display ip routing-table

Route Flags: R - relay, D - download to fib

Routing Tables: Public

Destinations : 13 Routes : 13

Destination/Mask	Proto	Pre	Cost	Flags	NextHop	Interface
10.0.1.1/32	Direct	0	0	D	127.0.0.1	LoopBack0
10.0.1.2/32	Static	60	0	RD	10.0.12.2	GigabitEthernet
0/0/0						
10.0.1.3/32	Static	60	0	RD	10.0.13.3	GigabitEthernet
0/0/2						
10.0.12.0/24	Direct	0	0	D	10.0.12.1	GigabitEthernet
0/0/0						
10.0.12.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.12.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.13.0/24	Direct	0	0	D	10.0.13.1	GigabitEthernet
0/0/2						
10.0.13.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
10.0.13.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/2						
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	0	D	127.0.0.1	InLoopBack0
255.255.255.255/32	Direct	0	0	D	127.0.0.1	InLoopBack0

Настройка маршрута по умолчанию

r1

```
[r1]ip route-static 0.0.0.0 0 10.0.12.2
```

```
[r1]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	Static	60	0	RD	10.0.12.2	GigabitEthernet
0/0/0						
10.0.1.1/32	Direct	0	0	D	127.0.0.1	LoopBack0
10.0.1.2/32	Static	60	0	RD	10.0.12.2	GigabitEthernet
0/0/0						
10.0.1.3/32	Static	60	0	RD	10.0.13.3	GigabitEthernet
0/0/2						
10.0.12.0/24	Direct	0	0	D	10.0.12.1	GigabitEthernet
0/0/0						
10.0.12.1/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.12.255/32	Direct	0	0	D	127.0.0.1	GigabitEthernet
0/0/0						
10.0.13.0/24	Direct	0	0	D	10.0.13.1	GigabitEthernet
0/0/2						

```

10.0.13.1/32 Direct 0 0 D 127.0.0.1 GigabitEthernet
0/0/2
10.0.13.255/32 Direct 0 0 D 127.0.0.1 GigabitEthernet
0/0/2
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 0 D 127.0.0.1 InLoopBack0
255.255.255.255/32 Direct 0 0 D 127.0.0.1 InLoopBack0
[r1]ping -a 10.0.1.1 10.0.1.2
PING 10.0.1.2: 56 data bytes, press CTRL_C to break
Reply from 10.0.1.2: bytes=56 Sequence=1 ttl=255 time=40 ms
Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=255 time=20 ms
Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=20 ms
Reply from 10.0.1.2: bytes=56 Sequence=4 ttl=255 time=30 ms
Reply from 10.0.1.2: bytes=56 Sequence=5 ttl=255 time=20 ms

--- 10.0.1.2 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 20/26/40 ms

```

Конфигурационные файлы

r1

```

[V200R003C00]

#

sysname R1

#

snmp-agent local-engineid 800007DB0300000000000000

snmp-agent

#

clock timezone China-Standard-Time minus 08:00:00

#

portal local-server load portalpage.zip

#

drop illegal-mac alarm

```

```

#
set cpu-usage threshold 80 restore 75
#
aaa
authentication-scheme default
authorization-scheme default
accounting-scheme default
domain default
domain default_admin
local-user admin password cipher %$$K8m.Nt84DZ}e#<0`8bmE3Uw}%$$
local-user admin service-type http
#
firewall zone Local
priority 15
#
interface GigabitEthernet0/0/0
ip address 10.0.12.1 255.255.255.0
#
interface GigabitEthernet0/0/1
#
interface GigabitEthernet0/0/2
ip address 10.0.13.1 255.255.255.0
#
interface NULL0
#
interface LoopBack0

```



```
ip address 10.0.1.1 255.255.255.255

#

ip route-static 0.0.0.0 0.0.0.0 10.0.12.2

ip route-static 10.0.1.2 255.255.255.255 10.0.12.2

ip route-static 10.0.1.2 255.255.255.255 10.0.13.3 preference 100

ip route-static 10.0.1.3 255.255.255.255 10.0.13.3

#

user-interface con 0

authentication-mode password

user-interface vty 0 4

user-interface vty 16 20

#

wlan ac

#

return

r2

[V200R003C00]

#

sysname R2

#

snmp-agent local-engineid 800007DB03000000000000

snmp-agent

#

clock timezone China-Standard-Time minus 08:00:00

#

portal local-server load portalpage.zip
```

```

#
drop illegal-mac alarm

#
set cpu-usage threshold 80 restore 75

#
aaa

authentication-scheme default

authorization-scheme default

accounting-scheme default

domain default

domain default_admin

local-user admin password cipher %$$$K8m.Nt84DZ}e#<0`8bmE3Uw}%$$$

local-user admin service-type http

#
firewall zone Local

priority 15

#

interface GigabitEthernet0/0/0

ip address 10.0.12.2 255.255.255.0

#

interface GigabitEthernet0/0/1

ip address 10.0.23.2 255.255.255.0

#

interface GigabitEthernet0/0/2

#

interface NULL0

```

```

#
interface LoopBack0
ip address 10.0.1.2 255.255.255.255
#
ip route-static 10.0.1.1 255.255.255.255 10.0.12.1
ip route-static 10.0.1.1 255.255.255.255 10.0.23.3 preference 100
ip route-static 10.0.1.3 255.255.255.255 10.0.23.3
#
user-interface con 0
authentication-mode password
user-interface vty 0 4
user-interface vty 16 20
#
wlan ac
#
return
r3
[V200R003C00]
#
sysname R3
#
snmp-agent local-engineid 800007DB03000000000000
snmp-agent
#
clock timezone China-Standard-Time minus 08:00:00
#

```

```

portal local-server load portalpage.zip

#

drop illegal-mac alarm

#

set cpu-usage threshold 80 restore 75

#

aaa

authentication-scheme default

authorization-scheme default

accounting-scheme default

domain default

domain default_admin

local-user admin password cipher %$$K8m.Nt84DZ}e#<0`8bmE3Uw}%$$

local-user admin service-type http

#

firewall zone Local

priority 15

#

interface GigabitEthernet0/0/0

#

interface GigabitEthernet0/0/1

ip address 10.0.23.3 255.255.255.0

#

interface GigabitEthernet0/0/2

ip address 10.0.13.3 255.255.255.0

#

```

```
interface NULL0

#

interface LoopBack0

ip address 10.0.1.3 255.255.255.255

#

ip route-static 10.0.1.1 255.255.255.255 10.0.13.1

ip route-static 10.0.1.2 255.255.255.255 10.0.23.2

#

user-interface con 0

authentication-mode password

user-interface vty 0 4

user-interface vty 16 20

#

wlan ac

#

return
```

Вывод

Во время выполнения лабораторной работы мы познакомились с работой в симуляторе eNSP и с его помощью настроили IPv4 адреса на интерфейсах, loopback адреса, статические маршруты и резервные маршруты.