Университет ИТМО

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Дисциплина «Администрирование систем и сетей»

Отчет

По лабораторной работе №2
Вариант на 3

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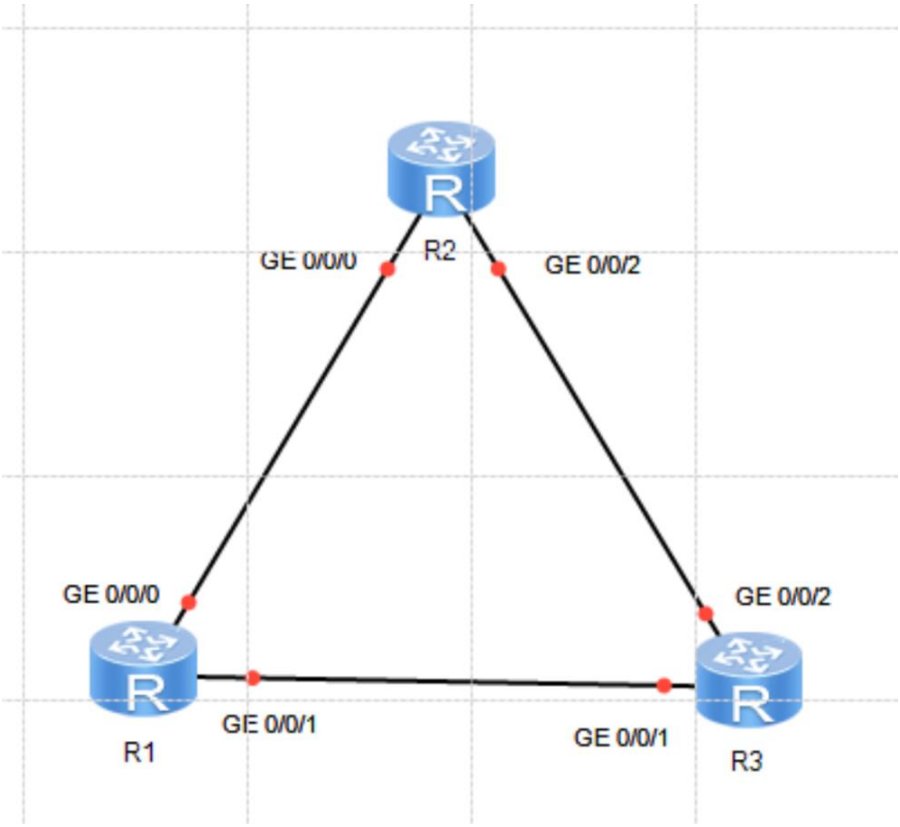
Оглавление

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

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

Конфигурация оборудования

Вывод IP-адреса текущего интерфейса и таблицы маршрутизации маршрутизатора

```
<r1>display ip interface brief

*down: administratively down

^down: standby

(l): 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           up         down

GigabitEthernet0/0/2              unassigned           down       down

NULL0                             unassigned           up         up(s)
```

Вывод таблицы маршрутизации на маршрутизаторе 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	GigabitEthernet0/0/1	10.0.13.1/24
	GigabitEthernet0/0/0	10.0.12.1/24
R2	GigabitEthernet0/0/0	10.0.12.2/24
	GigabitEthernet0/0/2	10.0.23.2/24

R3	GigabitEthernet0/0/1	10.0.13.3/24
	GigabitEthernet0/0/2	10.0.23.3/24

Процесс конфигурации оборудования

```
r1
[r1]interface GigabitEthernet0/0/1
[r1-GigabitEthernet0/0/1]ip address 10.0.13.1 24
Sep 20 2022 03:04:24-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[0]:The
line protocol
 IP on the interface GigabitEthernet0/0/1 has entered the UP state.
[r1-GigabitEthernet0/0/1]quit
[r1]interface GigabitEthernet0/0/0
[r1-GigabitEthernet0/0/0]ip address 10.0.12.1 24
Sep 20 2022 03:05:22-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[1]:The
line protocol
 IP on the interface GigabitEthernet0/0/0 has entered the UP state.
[r1-GigabitEthernet0/0/0]quit

r2
[r2]interface GigabitEthernet0/0/0
[r2-GigabitEthernet0/0/0]ip address 10.0.12.2 24
Sep 20 2022 03:06:50-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[0]:The
line protocol
 IP on the interface GigabitEthernet0/0/0 has entered the UP state.
[r2-GigabitEthernet0/0/0]quit
[r2]interface GigabitEthernet0/0/2
[r2-GigabitEthernet0/0/2]ip address 10.0.23.2 24

Sep 20 2022 03:08:24-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[2]:The
line protocol
 IP on the interface GigabitEthernet0/0/2 has entered the UP state.
[r2-GigabitEthernet0/0/2]quit
```

```
r3
[r3]interface GigabitEthernet0/0/1
[r3-GigabitEthernet0/0/1]ip address 10.0.13.3 24
Sep 20 2022 03:09:03-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[0]:The
line protocol
 IP on the interface GigabitEthernet0/0/1 has entered the UP state.
[r3-GigabitEthernet0/0/1]quit

[r3]interface GigabitEthernet0/0/2
[r3-GigabitEthernet0/0/2]ip address 10.0.23.3 24
Sep 20 2022 03:09:19-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[1]:The
line protocol
 IP on the interface GigabitEthernet0/0/2 has entered the UP state.
[r3-GigabitEthernet0/0/2]quit
```

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=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=10 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 = 10/34/80 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=20 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=30 ms

  --- 10.0.13.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/28/50 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
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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
```

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]interface LoopBack0
[r1-LoopBack0]ip address 10.0.1.1 32

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

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

Таблица маршрутизации для r1

```
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
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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
    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
0/0/1
      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
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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]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-s
[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=30 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=30 ms

  --- 10.0.1.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/26/30 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=50 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=30 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=40 ms

  --- 10.0.1.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/34/50 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=20 ms
    Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=255 time=10 ms
```

```
    Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=10 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=30 ms

  --- 10.0.1.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 10/18/30 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
0/0/1
      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
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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
```

```
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
0/0/2
      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
0/0/2
      10.0.23.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/2
    10.0.23.255/32  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
```

Выключение интерфейса для активации резервного маршрута

```
r1
[r1]interface GigabitEthernet0/0/0
[r1-GigabitEthernet0/0/0]shutdown
Sep 20 2022 03:46:52-08:00 Huawei %%01IFPDT/4/IF_STATE(l)[0]:Interface GigabitEt
hernet0/0/0 has turned into DOWN state.

[Huawei]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
0/0/1
       10.0.1.3/32  Static  60   0          RD   10.0.13.3       GigabitEthernet
```

```
0/0/1
      10.0.13.0/24  Direct  0    0           D   10.0.13.1       GigabitEthernet
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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

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
0/0/2
       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
0/0/2
      10.0.23.0/24  Direct  0    0           D   10.0.23.2       GigabitEthernet
0/0/2
      10.0.23.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/2
    10.0.23.255/32  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
[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=30 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 = 20/22/30 ms
```

```
[r1]tracert -a 10.0.1.1 10.0.1.2

 traceroute 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 40 ms  20 ms  20 ms

 2 10.0.23.2 20 ms  30 ms  20 ms
```

Включение интерфейсов и удаление настроенных маршрутов

```
r1
[r1]interface GigabitEthernet0/0/0
[r1-GigabitEthernet0/0/0]undo shutdown
[r1-GigabitEthernet0/0/0]qu
Sep 20 2022 03:51:12-08:00 Huawei %%01IFPDT/4/IF_STATE(l)[2]:Interface GigabitEt
hernet0/0/0 has turned into UP state.
[r1-GigabitEthernet0/0/0]qu
Sep 20 2022 03:51:12-08:00 Huawei %%01IFNET/4/LINK_STATE(l)[3]:The line protocol
 IP on the interface GigabitEthernet0/0/0 has entered the UP state.
[r1]undo ip route-static 10.0.1.2 32 10.0.13.3
[r1]undo ip route-static 10.0.1.2 32 10.0.12.2
[r1]display ip routing-table
Route Flags: R - relay, D - download to fib
------------------------------------------------------------------------------
Routing Tables: Public
         Destinations : 12       Routes : 12

Destination/Mask    Proto   Pre  Cost      Flags NextHop         Interface

       10.0.1.1/32  Direct  0    0           D   127.0.0.1       LoopBack0
       10.0.1.3/32  Static  60   0          RD   10.0.13.3       GigabitEthernet
0/0/1
      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
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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
```

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 : 13       Routes : 13

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
       10.0.1.3/32  Static  60   0           RD   10.0.13.3       GigabitEthernet
0/0/1
      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
0/0/1
      10.0.13.1/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
    10.0.13.255/32  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]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=10 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=40 ms

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

Конфигурационные файлы

r1

```
interface GigabitEthernet0/0/0
 ip address 10.0.12.1 255.255.255.0
#
interface GigabitEthernet0/0/1
 ip address 10.0.13.1 255.255.255.0
#
interface GigabitEthernet0/0/2
#
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 10.0.1.3 255.255.255.255 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

```
interface GigabitEthernet0/0/0
 ip address 10.0.12.2 255.255.255.0
#
interface GigabitEthernet0/0/1
#
interface GigabitEthernet0/0/2
 ip address 10.0.23.2 255.255.255.0
#
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

interface GigabitEthernet0/0/0
#
interface GigabitEthernet0/0/1
 ip address 10.0.13.3 255.255.255.0
#
interface GigabitEthernet0/0/2
 ip address 10.0.23.3 255.255.255.0
#
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.