Федеральное государственное автономное образовательное учреждение высшего образования «Национальный исследовательский университет ИТМО»

«Администрирование систем и сетей»

Лабораторная работа №2

Адресация и маршрутизация IPv4

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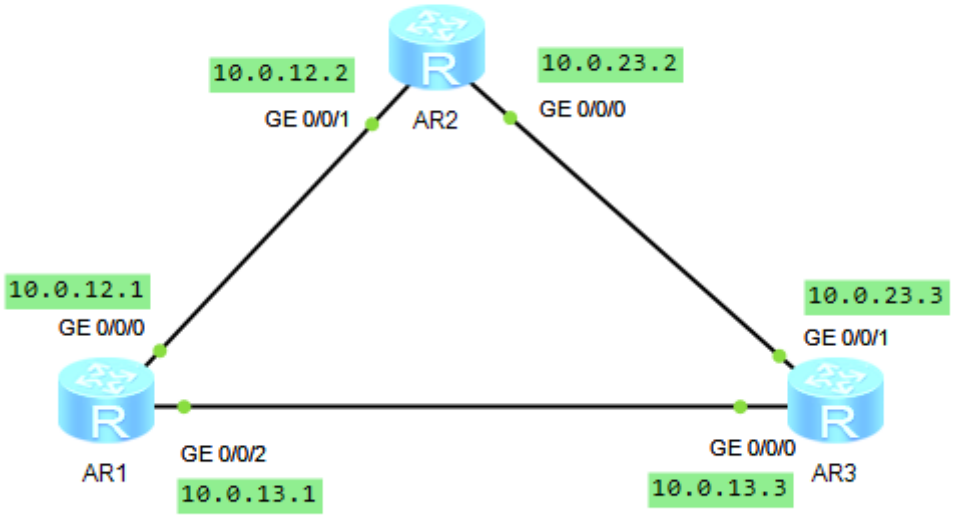
Содержание

Топология


10.0.12.2
GE 0/0/1
AR2
10.0.23.2
GE 0/0/0
10.0.12.1
GE 0/0/0
10.0.23.3
GE 0/0/1
AR1
GE 0/0/2
10.0.13.1
GE 0/0/0
10.0.13.3
AR3

Конфигурация

Смена имен устройств

<Huawei>system-view

[Huawei]sysname ARN

IP адреса физических интерфейсов

Маршрутизатор	Интерфейс	Ip/маска
AR1	GigabitEthernet0/0/0	10.0.12.1/24
	GigabitEthernet0/0/2	10.0.13.1/24
AR2	GigabitEthernet0/0/0	10.0.23.2 24
	GigabitEthernet0/0/1	10.0.12.2/24
AR3	GigabitEthernet0/0/0	10.0.13.3 24
	GigabitEthernet0/0/1	10.0.23.3 24

Настройка IP адресов маршрутизаторов

AR1

IP

<AR1>system-view

[AR1]interface GigabitEthernet0/0/2

[AR1-GigabitEthernet0/0/2]ip address 10.0.13.1 24

[AR1-GigabitEthernet0/0/2]quit

[AR1]interface GigabitEthernet0/0/0

[AR1-GigabitEthernet0/0/0]ip address 10.0.12.1 24

[AR1-GigabitEthernet0/0/0]quit

Loopback интерфейс

[AR1]interface LoopBack0

[AR1-LoopBack0]ip address 10.0.1.1 32

Таблицы и пинги

[AR1]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
```

[AR1]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=1000 ms
    Reply from 10.0.12.2: bytes=56 Sequence=2 ttl=255 time=130 ms
    Reply from 10.0.12.2: bytes=56 Sequence=3 ttl=255 time=40 ms
    Reply from 10.0.12.2: bytes=56 Sequence=4 ttl=255 time=60 ms
    Reply from 10.0.12.2: bytes=56 Sequence=5 ttl=255 time=30 ms

  --- 10.0.12.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 30/252/1000 ms
```

[AR1]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=570 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=40 ms
    Reply from 10.0.13.3: bytes=56 Sequence=5 ttl=255 time=40 ms

  --- 10.0.13.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 30/142/570 ms
```

AR2

IP

<AR2>system-view

[AR2]interface GigabitEthernet0/0/1

[AR2-GigabitEthernet0/0/1]ip addres 10.0.12.2 24

[AR2-GigabitEthernet0/0/1]quit

[AR2]interface GigabitEthernet0/0/0

[AR2-GigabitEthernet0/0/0]ip addres 10.0.23.2 24

[AR2-GigabitEthernet0/0/0]quit

Loopback интерфейс

[AR2]interface LoopBack0

[AR2-LoopBack0]ip address 10.0.1.2 32

Таблицы и пинги

[AR2]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

        10.0.1.2/32  Direct  0    0           D   127.0.0.1       LoopBack0
       10.0.12.0/24  Direct  0    0           D   10.0.12.2       GigabitEthernet
0/0/1
       10.0.12.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
     10.0.12.255/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
       10.0.23.0/24  Direct  0    0           D   10.0.23.2       GigabitEthernet
0/0/0
       10.0.23.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/0
     10.0.23.255/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
```

```
0/0/0
      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    0           D   127.0.0.1       InLoopBack0
255.255.255.255/32  Direct  0    0           D   127.0.0.1       InLoopBack0
```

[AR2]ping 10.0.12.1

```
  PING 10.0.12.1: 56  data bytes, press CTRL_C to break
    Reply from 10.0.12.1: bytes=56 Sequence=1 ttl=255 time=110 ms
    Reply from 10.0.12.1: bytes=56 Sequence=2 ttl=255 time=70 ms
    Reply from 10.0.12.1: bytes=56 Sequence=3 ttl=255 time=30 ms
    Reply from 10.0.12.1: bytes=56 Sequence=4 ttl=255 time=70 ms
    Reply from 10.0.12.1: bytes=56 Sequence=5 ttl=255 time=40 ms

  --- 10.0.12.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 30/64/110 ms
```

[AR2]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=130 ms
    Reply from 10.0.23.3: bytes=56 Sequence=2 ttl=255 time=50 ms
    Reply from 10.0.23.3: bytes=56 Sequence=3 ttl=255 time=20 ms
    Reply from 10.0.23.3: bytes=56 Sequence=4 ttl=255 time=50 ms
    Reply from 10.0.23.3: bytes=56 Sequence=5 ttl=255 time=20 ms

  --- 10.0.23.3 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 20/54/130 ms
```

AR3

IP

<AR3>system-view

[AR3]interface GigabitEthernet0/0/1

[AR3-GigabitEthernet0/0/1]ip address 10.0.23.3 24

[AR3-GigabitEthernet0/0/1]quit

[AR3]interface GigabitEthernet0/0/0

[AR3-GigabitEthernet0/0/0]ip address 10.0.13.3 24

[AR3-GigabitEthernet0/0/0]quit

Loopback интерфейс

[AR3]interface LoopBack0

[AR3-LoopBack0]ip address 10.0.1.3 32

Таблицы и пинги

[AR3-LoopBack0]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

        10.0.1.3/32  Direct  0    0           D   127.0.0.1       LoopBack0
       10.0.13.0/24  Direct  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
       10.0.23.0/24  Direct  0    0           D   10.0.23.3       GigabitEthernet
0/0/1
       10.0.23.3/32  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
```

[AR3-LoopBack0]ping 10.0.23.2

```
  PING 10.0.23.2: 56  data bytes, press CTRL_C to break
    Reply from 10.0.23.2: bytes=56 Sequence=1 ttl=255 time=90 ms
    Reply from 10.0.23.2: bytes=56 Sequence=2 ttl=255 time=50 ms
    Reply from 10.0.23.2: bytes=56 Sequence=3 ttl=255 time=40 ms
    Reply from 10.0.23.2: bytes=56 Sequence=4 ttl=255 time=60 ms
    Reply from 10.0.23.2: bytes=56 Sequence=5 ttl=255 time=50 ms

  --- 10.0.23.2 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 40/58/90 ms
```

[AR3-LoopBack0]ping 10.0.13.1

```
  PING 10.0.13.1: 56  data bytes, press CTRL_C to break
    Reply from 10.0.13.1: bytes=56 Sequence=1 ttl=255 time=30 ms
    Reply from 10.0.13.1: bytes=56 Sequence=2 ttl=255 time=50 ms
    Reply from 10.0.13.1: bytes=56 Sequence=3 ttl=255 time=50 ms
    Reply from 10.0.13.1: bytes=56 Sequence=4 ttl=255 time=50 ms
    Reply from 10.0.13.1: bytes=56 Sequence=5 ttl=255 time=60 ms

  --- 10.0.13.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 30/48/60 ms
```

Настройка статических маршрутов между маршрутизаторами

AR1

[AR1]ip route-static 10.0.1.2 32 10.0.12.2

[AR1]ip route-static 10.0.1.3 32 10.0.13.3

[AR1]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
```

[AR1]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=50 ms
  Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=255 time=40 ms
  Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=40 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 = 20/36/50 ms
```

[AR1]ping -a 10.0.1.1 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=80 ms
  Reply from 10.0.1.3: bytes=56 Sequence=2 ttl=255 time=70 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=40 ms
  Reply from 10.0.1.3: bytes=56 Sequence=5 ttl=255 time=50 ms

--- 10.0.1.3 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 30/54/80 ms
```

AR2

[AR2]ip route-static 10.0.1.1 32 10.0.12.1

[AR2]ip route-static 10.0.1.3 32 10.0.23.3

[AR2]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
0/0/1
        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
0/0/0
       10.0.12.0/24  Direct  0    0           D   10.0.12.2       GigabitEthernet
0/0/1
       10.0.12.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
     10.0.12.255/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/1
       10.0.23.0/24  Direct  0    0           D   10.0.23.2       GigabitEthernet
0/0/0
       10.0.23.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/0
     10.0.23.255/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/0
       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    0           D   127.0.0.1       InLoopBack0
255.255.255.255/32  Direct  0    0           D   127.0.0.1       InLoopBack0
```

[AR2]ping -a 10.0.1.2 10.0.1.1

```
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=30 ms
  Reply from 10.0.1.1: bytes=56 Sequence=3 ttl=255 time=50 ms
  Reply from 10.0.1.1: bytes=56 Sequence=4 ttl=255 time=50 ms
  Reply from 10.0.1.1: bytes=56 Sequence=5 ttl=255 time=80 ms

--- 10.0.1.1 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 30/48/80 ms
```

[AR2]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=80 ms
  Reply from 10.0.1.3: bytes=56 Sequence=2 ttl=255 time=50 ms
  Reply from 10.0.1.3: bytes=56 Sequence=3 ttl=255 time=60 ms
  Reply from 10.0.1.3: bytes=56 Sequence=4 ttl=255 time=40 ms
  Reply from 10.0.1.3: bytes=56 Sequence=5 ttl=255 time=50 ms

--- 10.0.1.3 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 40/56/80 ms
```

AR3

[AR3]ip route-static 10.0.1.1 32 10.0.13.1

[AR3]ip route-static 10.0.1.2 32 10.0.23.2

[AR3]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   10.0.13.1       GigabitEthernet
0/0/0
        10.0.1.2/32  Static  60   0           RD   10.0.23.2       GigabitEthernet
0/0/1
        10.0.1.3/32  Direct  0    0           D   127.0.0.1       LoopBack0
       10.0.13.0/24  Direct  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
       10.0.23.0/24  Direct  0    0           D   10.0.23.3       GigabitEthernet
0/0/1
       10.0.23.3/32  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
```

[AR3]ping -a 10.0.1.3 10.0.1.1

```
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=40 ms
  Reply from 10.0.1.1: bytes=56 Sequence=2 ttl=255 time=70 ms
  Reply from 10.0.1.1: bytes=56 Sequence=3 ttl=255 time=40 ms
  Reply from 10.0.1.1: bytes=56 Sequence=4 ttl=255 time=50 ms
  Reply from 10.0.1.1: bytes=56 Sequence=5 ttl=255 time=40 ms

--- 10.0.1.1 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 40/48/70 ms
```

[AR3]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=60 ms
  Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=40 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 = 20/38/60 ms
```

Настройка резервных маршрутов

[AR1]ip route-static 10.0.1.2 32 10.0.13.3 preference 100

[AR2]ip route-static 10.0.1.1 32 10.0.23.3 preference 100

[AR1]interface GigabitEthernet0/0/0

[AR1-GigabitEthernet0/0/0]shutdown

[AR1]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
```

[AR2]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
0/0/0
       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
0/0/0
      10.0.23.0/24  Direct  0    0           D   10.0.23.2       GigabitEthernet
0/0/0
      10.0.23.2/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/0
    10.0.23.255/32  Direct  0    0           D   127.0.0.1       GigabitEthernet
0/0/0
      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    0           D   127.0.0.1       InLoopBack0
255.255.255.255/32  Direct  0    0           D   127.0.0.1       InLoopBack0
```

[AR1]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 30 ms  50 ms  20 ms
 2 10.0.23.2 80 ms  50 ms  40 ms
```

Настройка маршрутов между Loopback AR1 и AR1

[AR1]undo ip route-static 10.0.1.2 255.255.255.255 10.0.12.2

[AR1]undo ip route-static 10.0.1.2 255.255.255.255 10.0.13.3

[AR1]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
0/0/2
       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
```

[AR1]ip route-static 0.0.0.0 0 10.0.12.2

[AR1]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
0/0/2
      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
```

[AR1]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=380 ms
```

```
  Reply from 10.0.1.2: bytes=56 Sequence=2 ttl=255 time=50 ms

  Reply from 10.0.1.2: bytes=56 Sequence=3 ttl=255 time=50 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 = 30/110/380 ms
```

Полезные команды

display ip interface brief – ip адреса интерфейсов

display ip routing-table – таблица маршрутизации