

Минобрнауки России
Федеральное государственное бюджетное образовательное
учреждение высшего образования
НИЖЕГОРОДСКИЙ ГОСУДАРСТВЕННЫЙ ТЕХНИЧЕСКИЙ УНИВЕРСИТЕТ
ИМ. Р.Е. АЛЕКСЕЕВА
ИНСТИТУТ РАДИОЭЛЕКТРОНИКИ И ИНФОРМАЦИОННЫХ
ТЕХНОЛОГИЙ

Курс “Сети и телекоммуникации”
Отчет по лабораторной работе №2

Выполнил: студент группы 18 В-1

Грачев Д.С.

Проверил: Гай В.Е.

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Задание:

1. Смоделировать сеть
2. Расставить IP адреса и маски (у роутеров на интерфейсах ip адреса – из начала диапазона)
3. Добавить маршруты для прохождения пакетов между всеми частями сети (ipforwarding)
4. сделать несколько маршрутов специфичных, показать, как это работает (удаляя и добавляя маршрут)
5. показать пример удаления маршрута с демонстрацией отсутствия ping

Вариант 3

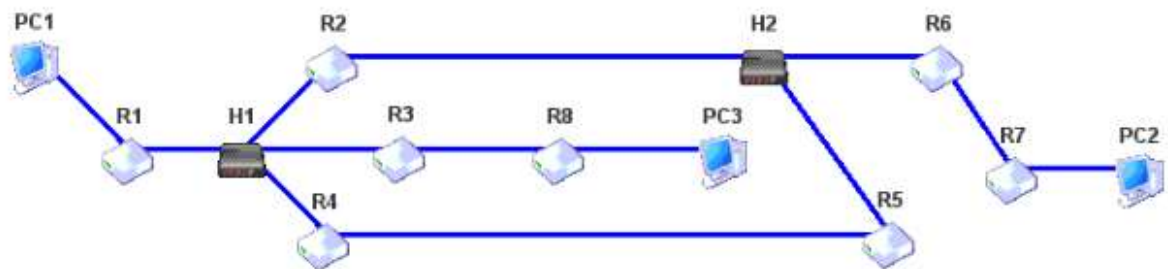
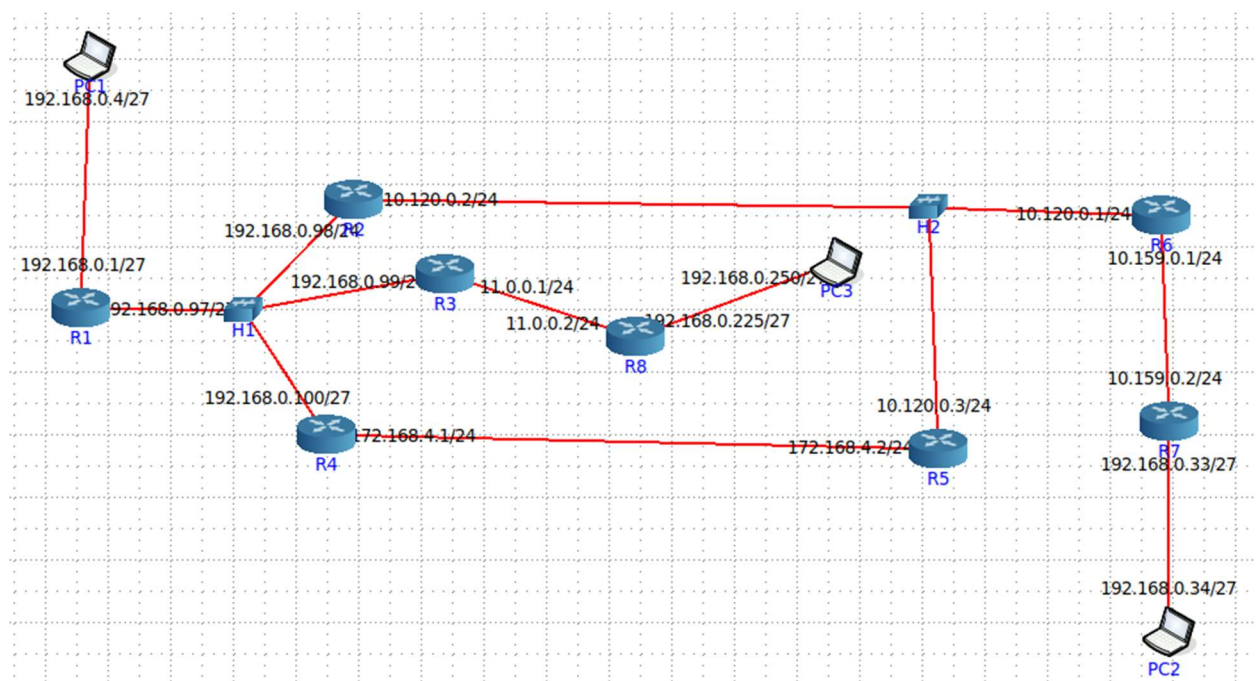


Рис. 2.4. Структура исследуемой сетевой архитектуры - вариант №3

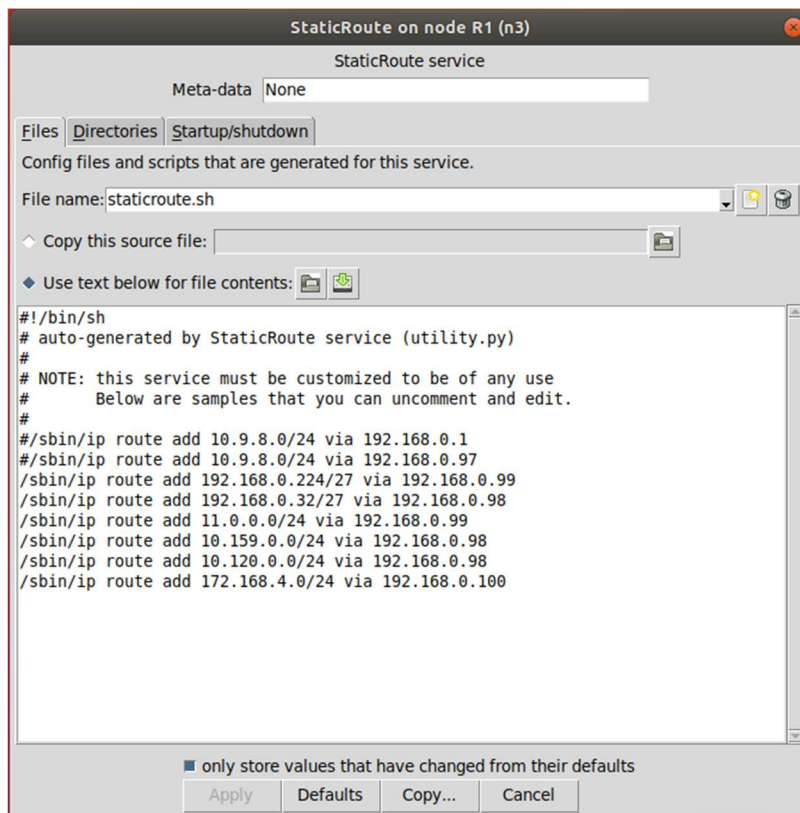
- Файл со схемой сети: lab2_var3.jfst.
- Сеть между маршрутизаторами R1, R2, R3 и R4: 192.168.0.96.
- Сеть между маршрутизаторами R4 и R5: 172.168.4.0.
- Маршрутизатор R6 имеет адрес 10.120.0.1 на первом интерфейсе и 10.159.0.1 на втором интерфейсе.
- Сеть между маршрутизаторами R3 и R8: 11.0.0.0.
- Компьютер PC1 имеет IP-адрес 192.168.0.4.
- Компьютер PC3 имеет IP-адрес 192.168.0.34.
- Компьютер PC4 имеет IP-адрес: 192.168.0.250.
- Обозначения в задании: K1 – PC1, K2 – PC3, K3 – PC4.

Структура сети после присвоения адресов и масок:

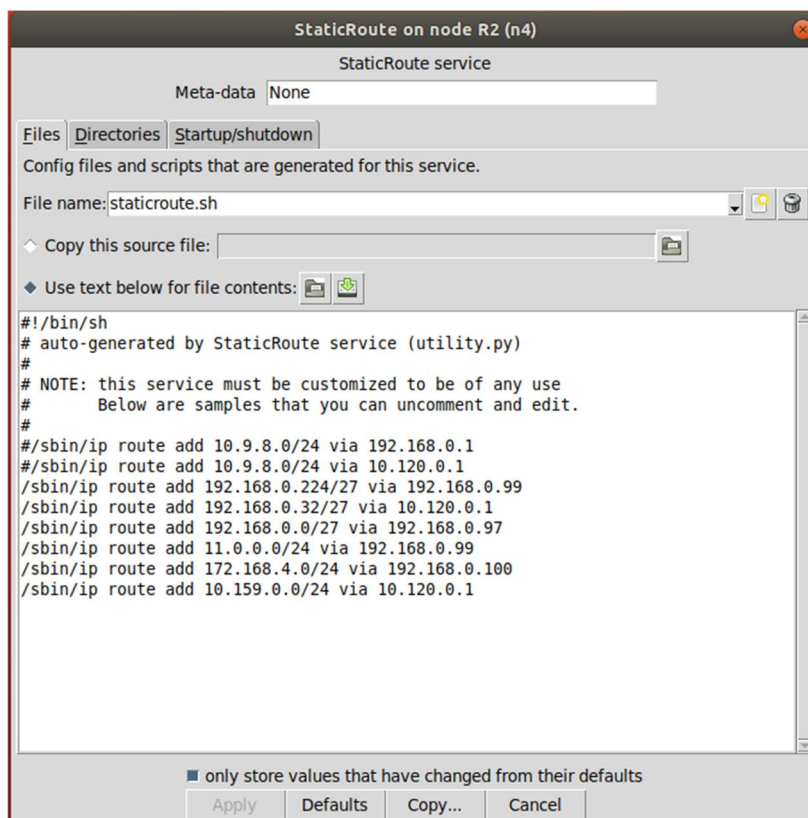


Добавляем маршруты для прохождения пакетов во все части сети

Конфигурация R1



Конфигурация R2



Конфигурация R3

StaticRoute on node R3 (n6)

StaticRoute service

Meta-data: None

Files Directories Startup/shutdown

Config files and scripts that are generated for this service.

File name: staticroute.sh

Copy this source file:

Use text below for file contents:

```
#!/bin/sh
# auto-generated by StaticRoute service (utility.py)
#
# NOTE: this service must be customized to be of any use
#       Below are samples that you can uncomment and edit.
#
#/sbin/ip route add 10.9.8.0/24 via 192.168.0.97
#/sbin/ip route add 10.9.8.0/24 via 11.0.0.1

/sbin/ip route add 192.168.0.224/27 via 11.0.0.2
/sbin/ip route add 192.168.0.32/27 via 192.168.0.98
/sbin/ip route add 192.168.0.0/27 via 192.168.0.97
/sbin/ip route add 10.159.0.0/24 via 192.168.0.98
/sbin/ip route add 10.120.0.0/24 via 192.168.0.98
/sbin/ip route add 172.168.4.0/24 via 192.168.0.100
```

☒ only store values that have changed from their defaults

Apply Defaults Copy... Cancel

Конфигурация R4

StaticRoute on node R4 (n5)

StaticRoute service

Meta-data: None

Files Directories Startup/shutdown

Config files and scripts that are generated for this service.

File name: staticroute.sh

Copy this source file:

Use text below for file contents:

```
#!/bin/sh
# auto-generated by StaticRoute service (utility.py)
#
# NOTE: this service must be customized to be of any use
#       Below are samples that you can uncomment and edit.
#
#/sbin/ip route add 10.9.8.0/24 via 192.168.0.97
#/sbin/ip route add 10.9.8.0/24 via 172.168.4.1

/sbin/ip route add 192.168.0.224/27 via 192.168.0.99
/sbin/ip route add 192.168.0.32/27 via 172.168.4.2
/sbin/ip route add 192.168.0.0/27 via 192.168.0.97
/sbin/ip route add 11.0.0.0/24 via 192.168.0.99
/sbin/ip route add 10.120.0.0/24 via 172.168.4.2
/sbin/ip route add 10.159.0.0/24 via 172.168.4.2
```

☒ only store values that have changed from their defaults

Apply Defaults Copy... Cancel

Конфигурация R5

StaticRoute on node R5 (n8)

StaticRoute service

Meta-data: None

Files Directories Startup/shutdown

Config files and scripts that are generated for this service.

File name: staticroute.sh

Copy this source file:

Use text below for file contents:

```
#!/bin/sh
# auto-generated by StaticRoute service (utility.py)
#
# NOTE: this service must be customized to be of any use
#       Below are samples that you can uncomment and edit.
#
#/sbin/ip route add 10.9.8.0/24 via 172.168.4.1
#/sbin/ip route add 10.9.8.0/24 via 10.120.0.1

/sbin/ip route add 192.168.0.224/27 via 172.168.4.1
/sbin/ip route add 192.168.0.32/27 via 10.120.0.1
/sbin/ip route add 192.168.0.0/27 via 172.168.4.1
/sbin/ip route add 11.0.0.0/24 via 172.168.4.1
/sbin/ip route add 192.168.0.96/27 via 172.168.4.1
/sbin/ip route add 10.159.0.0/24 via 172.168.4.1
```

☒ only store values that have changed from their defaults

Apply Defaults Copy... Cancel

Конфигурация R6

StaticRoute on node R6 (n9)

StaticRoute service

Meta-data: None

Files Directories Startup/shutdown

Config files and scripts that are generated for this service.

File name: staticroute.sh

Copy this source file:

Use text below for file contents:

```
#!/bin/sh
# auto-generated by StaticRoute service (utility.py)
#
# NOTE: this service must be customized to be of any use
#       Below are samples that you can uncomment and edit.
#
#/sbin/ip route add 10.9.8.0/24 via 10.120.0.1
#/sbin/ip route add 10.9.8.0/24 via 10.159.0.1

/sbin/ip route add 192.168.0.224/27 via 10.120.0.2
/sbin/ip route add 192.168.0.32/27 via 10.159.0.2
/sbin/ip route add 192.168.0.0/27 via 10.120.0.2
/sbin/ip route add 192.168.0.96/27 via 10.120.0.2
/sbin/ip route add 172.168.4.0/24 via 10.120.0.3
/sbin/ip route add 11.0.0.0/24 via 10.120.0.2
```

☒ only store values that have changed from their defaults

Apply Defaults Copy... Cancel

Конфигурация R7

StaticRoute on node R7 (n10)

StaticRoute service

Meta-data: None

Files Directories Startup/shutdown

Config files and scripts that are generated for this service.

File name: staticroute.sh

Copy this source file:

Use text below for file contents:

```
#!/bin/sh
# auto-generated by StaticRoute service (utility.py)
#
# NOTE: this service must be customized to be of any use
#       Below are samples that you can uncomment and edit.
#
/sbin/ip route add 10.9.8.0/24 via 10.159.0.1
/sbin/ip route add 10.9.8.0/24 via 192.168.0.33

/sbin/ip route add 192.168.0.224/27 via 10.159.0.1
/sbin/ip route add 192.168.0.0/27 via 10.159.0.1
/sbin/ip route add 192.168.0.96/27 via 10.159.0.1
/sbin/ip route add 172.168.4.0/24 via 10.159.0.1
/sbin/ip route add 10.120.0.0/24 via 10.159.0.1
/sbin/ip route add 11.0.0.0/24 via 10.159.0.1
```

☒ only store values that have changed from their defaults

Apply Defaults Copy... Cancel

Конфигурация R8

StaticRoute on node R8 (n7)

StaticRoute service

Meta-data: None

Files Directories Startup/shutdown

Config files and scripts that are generated for this service.

File name: staticroute.sh

Copy this source file:

Use text below for file contents:

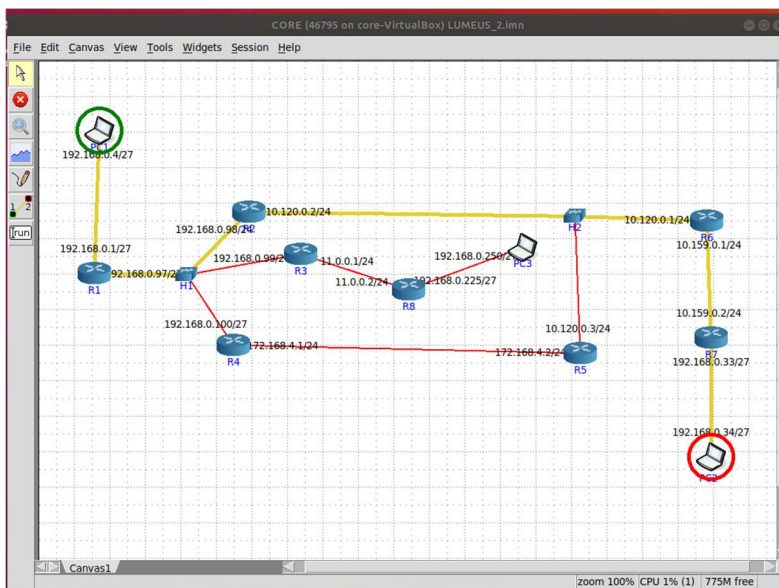
```
#!/bin/sh
# auto-generated by StaticRoute service (utility.py)
#
# NOTE: this service must be customized to be of any use
#       Below are samples that you can uncomment and edit.
#
/sbin/ip route add 10.9.8.0/24 via 11.0.0.1
/sbin/ip route add 10.9.8.0/24 via 192.168.0.225

/sbin/ip route add 192.168.0.32/27 via 11.0.0.1
/sbin/ip route add 192.168.0.0/27 via 11.0.0.1
/sbin/ip route add 192.168.0.96/27 via 11.0.0.1
/sbin/ip route add 172.168.4.0/24 via 11.0.0.1
/sbin/ip route add 10.120.0.0/24 via 11.0.0.1
/sbin/ip route add 10.159.0.0/24 via 11.0.0.1
```

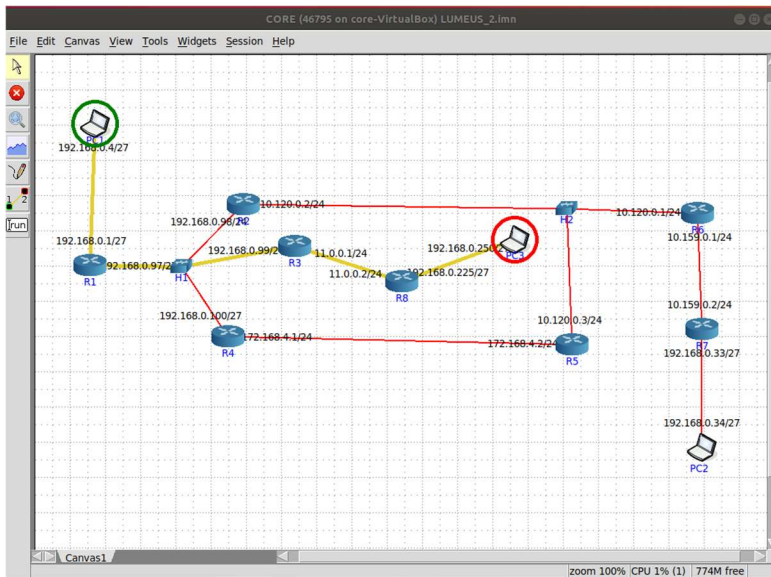
☒ only store values that have changed from their defaults

Apply Defaults Copy... Cancel

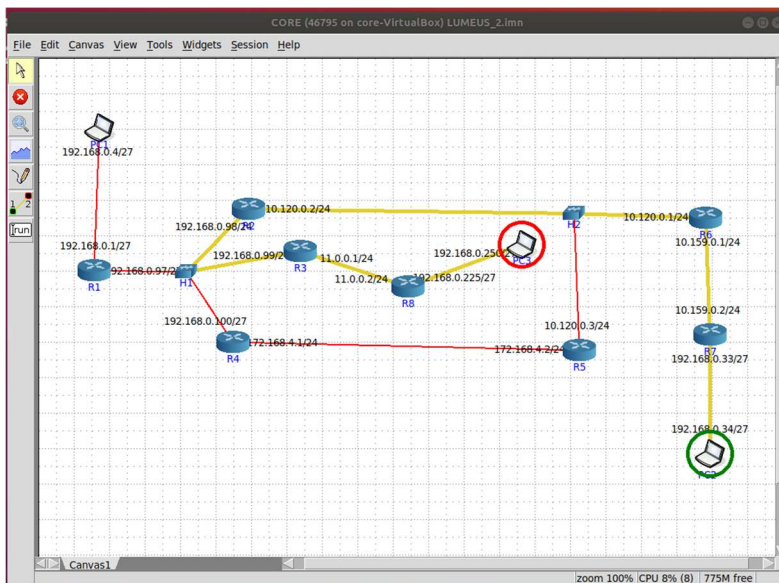
Проверяем ping



```
Two-node Tool
Nodes
source node n11 destination node n13 click to select nodes
Command line
tracert ping vcmd -c /tmp/pycore.46795/PC1 -- ping -R -n 192.168.0.34
Command results
vcmd -c /tmp/pycore.46795/PC1 -- ping -R -n 192.168.0.34
PING 192.168.0.34 (192.168.0.34) 56(124) bytes of data.
64 bytes from 192.168.0.34: icmp_seq=1 ttl=60 time=0.217 ms
RR: 192.168.0.4
192.168.0.97
10.120.0.2
10.159.0.1
192.168.0.33
192.168.0.34
192.168.0.34
10.159.0.2
10.120.0.1
64 bytes from 192.168.0.34: icmp_seq=2 ttl=60 time=0.179 ms (same route)
64 bytes from 192.168.0.34: icmp_seq=3 ttl=60 time=0.124 ms (same route)
64 bytes from 192.168.0.34: icmp_seq=4 ttl=60 time=0.178 ms (same route)
64 bytes from 192.168.0.34: icmp_seq=5 ttl=60 time=0.182 ms (same route)
```



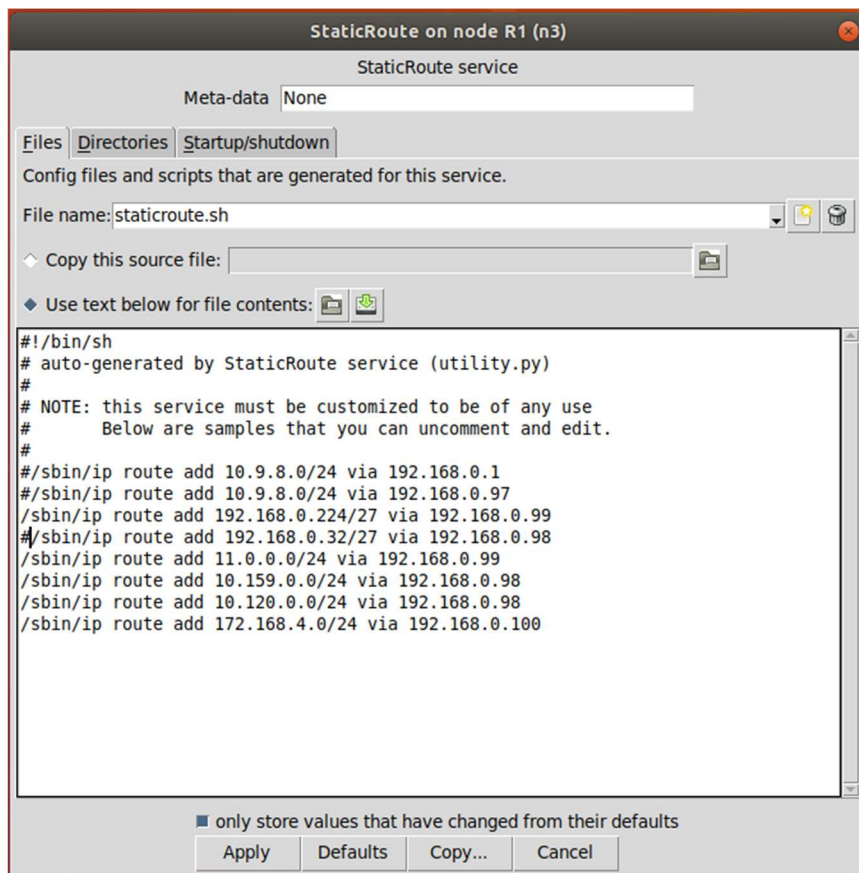
```
Two-node Tool
Nodes
source node n11 destination node n12 click to select nodes
Command line
tracert ping vcmd -c /tmp/pycore.46795/PC1 -- ping -R -n 192.168.0.250
Command results
vcmd -c /tmp/pycore.46795/PC1 -- ping -R -n 192.168.0.250
PING 192.168.0.250 (192.168.0.250) 56(124) bytes of data.
64 bytes from 192.168.0.250: icmp_seq=1 ttl=61 time=0.160 ms
RR: 192.168.0.4
192.168.0.97
11.0.0.1
192.168.0.225
192.168.0.250
192.168.0.250
11.0.0.2
192.168.0.99
192.168.0.1
64 bytes from 192.168.0.250: icmp_seq=2 ttl=61 time=0.065 ms (same route)
64 bytes from 192.168.0.250: icmp_seq=3 ttl=61 time=0.072 ms (same route)
64 bytes from 192.168.0.250: icmp_seq=4 ttl=61 time=0.086 ms (same route)
```



```
Two-node Tool
Nodes
source node n13 destination node n12 click to select nodes
Command line
tracert ping vcmd -c /tmp/pycore.46795/PC2 -- ping -R -n 192.168.0.250
Command results
vcmd -c /tmp/pycore.46795/PC2 -- ping -R -n 192.168.0.250
PING 192.168.0.250 (192.168.0.250) 56(124) bytes of data.
64 bytes from 192.168.0.250: icmp_seq=1 ttl=59 time=0.101 ms
RR: 192.168.0.34
10.159.0.2
10.120.0.1
192.168.0.98
11.0.0.1
192.168.0.225
192.168.0.250
192.168.0.250
11.0.0.2
64 bytes from 192.168.0.250: icmp_seq=2 ttl=59 time=0.239 ms (same route)
64 bytes from 192.168.0.250: icmp_seq=3 ttl=59 time=0.084 ms (same route)
64 bytes from 192.168.0.250: icmp_seq=4 ttl=59 time=0.196 ms (same route)
64 bytes from 192.168.0.250: icmp_seq=5 ttl=59 time=0.280 ms (same route)
```

Пример удаления маршрута

В роутере R1 удалим маршрут на 192.168.0.32/27



Ping между PC1 и PC2 отсутствует

