

Лабораторная работа № 6
“Разбиение сети на подсети. Настройка DHCP-сервера в сетевом эмуляторе”

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- Расчет подсетей

№ сети	К-во хостов в подсети	Сеть	Диапазон хостов	Широковещательный адрес	Маска
1	30	192.168.20.0	[192.168.20.1 - 192.168.20.30]	192.168.20.31	255.255.255.224 (27)
5	30	192.168.20.32	[192.168.20.33 - 192.168.20.62]	192.168.20.63	255.255.255.224 (27)
2	6	192.168.20.64	[192.168.20.65 - 192.168.20.70]	192.168.20.71	255.255.255.248 (29)
4	6	192.168.20.72	[192.168.20.73 - 192.168.20.78]	192.168.20.79	255.255.255.248 (29)
3	2	192.168.20.80	[192.168.20.81 - 192.168.20.82]	192.168.20.83	255.255.255.252 (30)

- Настройка DHCP-сервера для выдачи адресов

1. Настройка DHCP-сервер для подсети 1

Настройка router1:

```
Router>en
```

```
Router#conf t
```

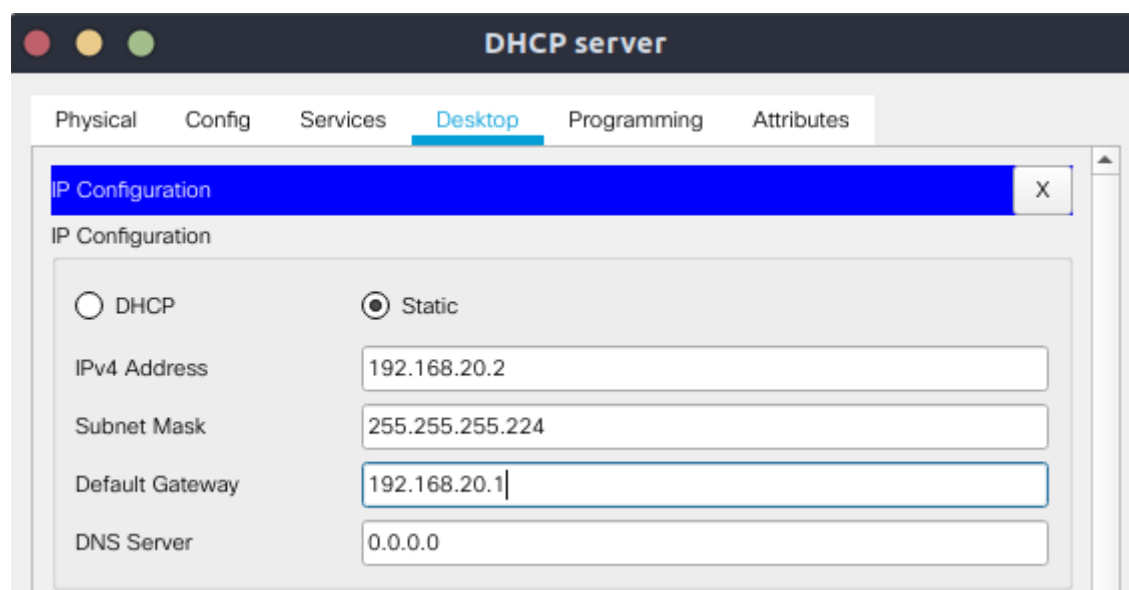
```
Enter configuration commands, one per line. End with CNTL/Z.
```

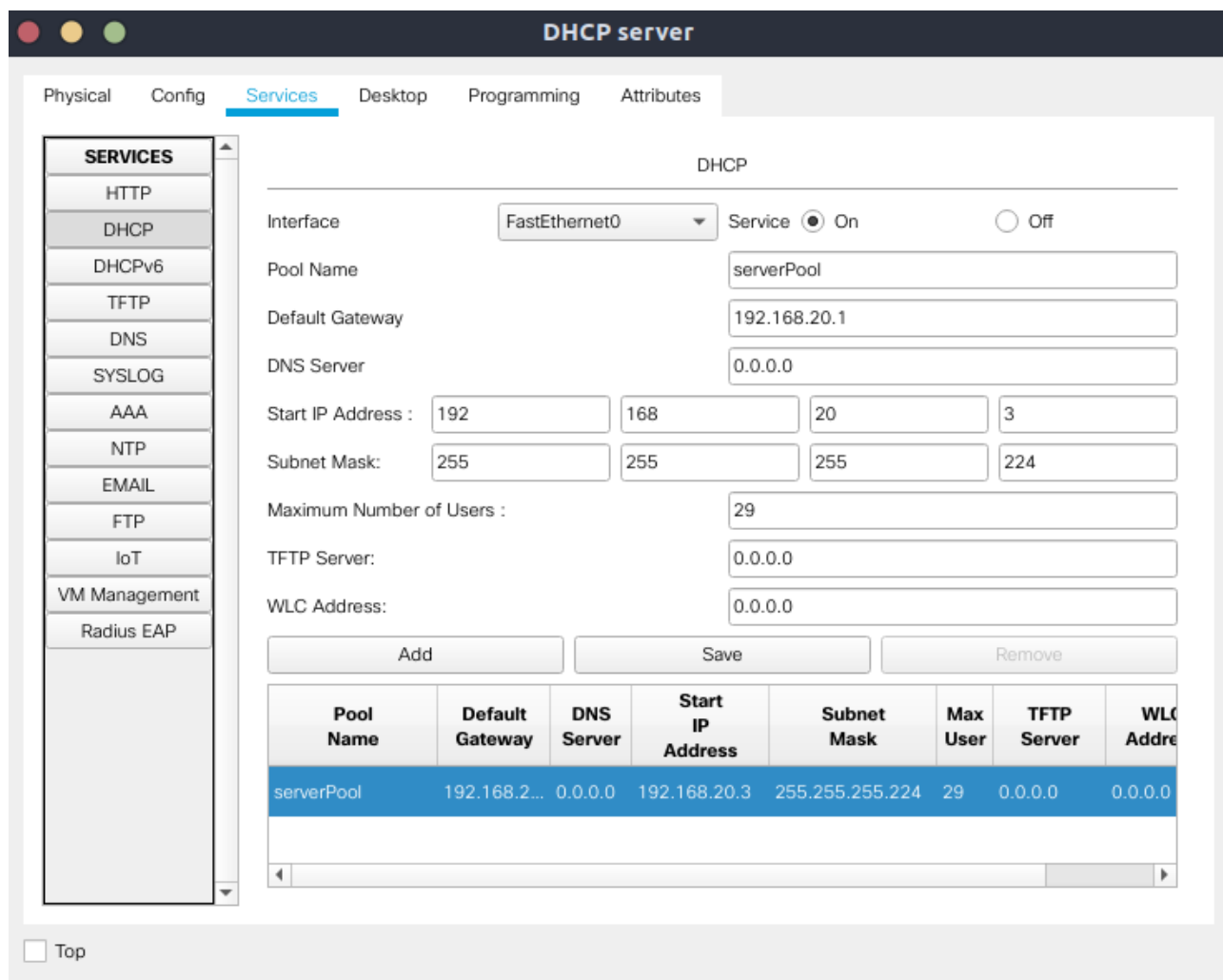
```
Router(config)#interface Gig0/0/0
```

```
Router(config-if)#ip address 192.168.20.1 255.255.255.224
```

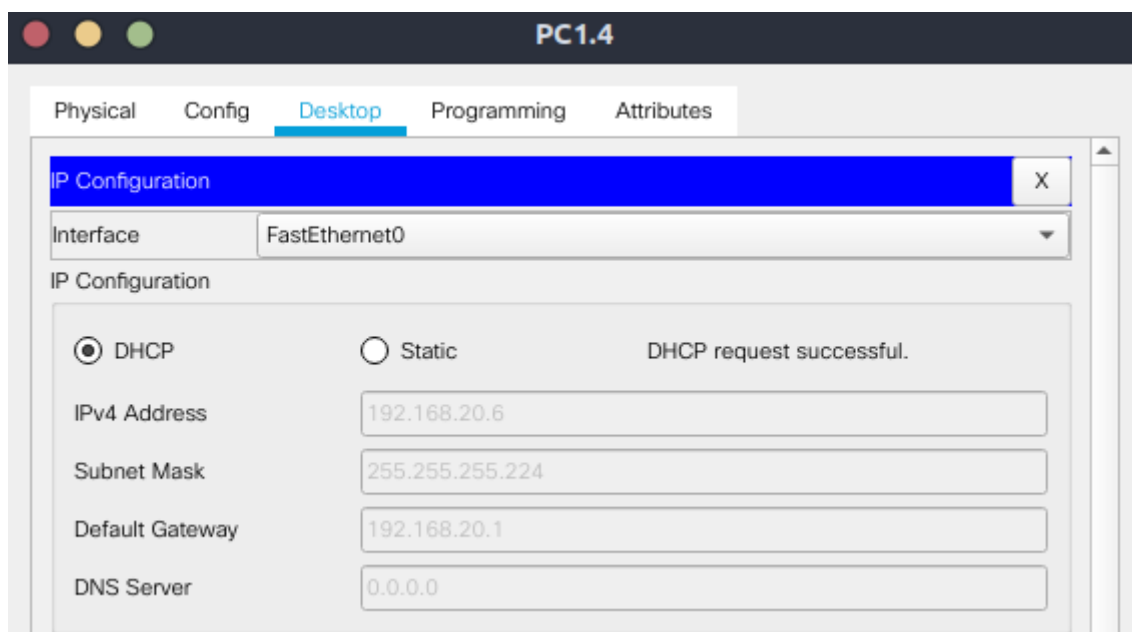
```
Router(config-if)#no sh
```

Настройка DHCP-сервера:

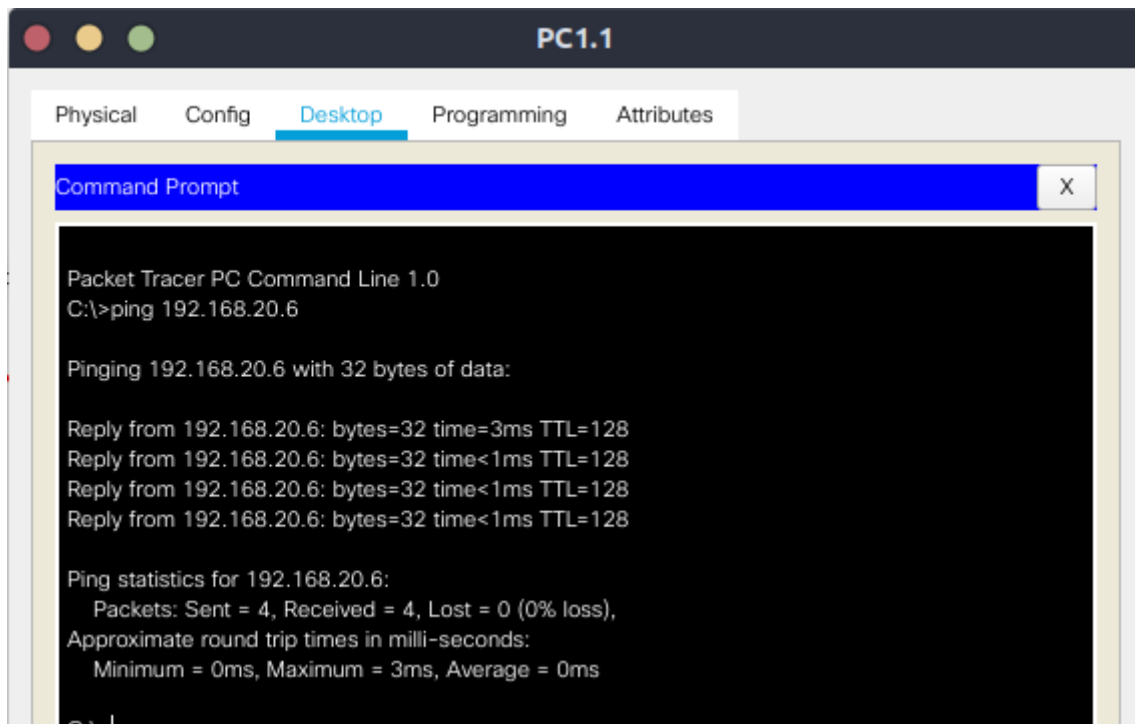




На хостах в подсети был запущен DHCP. Пример для PC1.4:



Проверка связи между PC1.1 и PC1.4:



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Настройка в качестве DHCP сервера маршрутизатор 1 для подсети 2

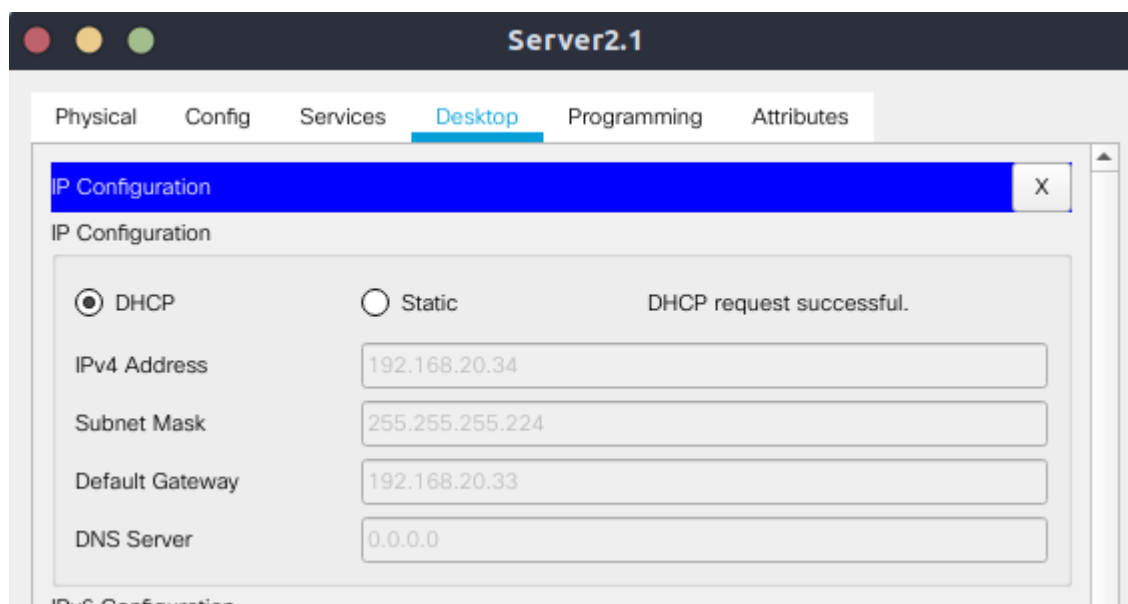
Настройка router1:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Gig0/0/1
Router(config-if)#ip address 192.168.20.33 255.255.255.224
Router(config-if)#no sh
```

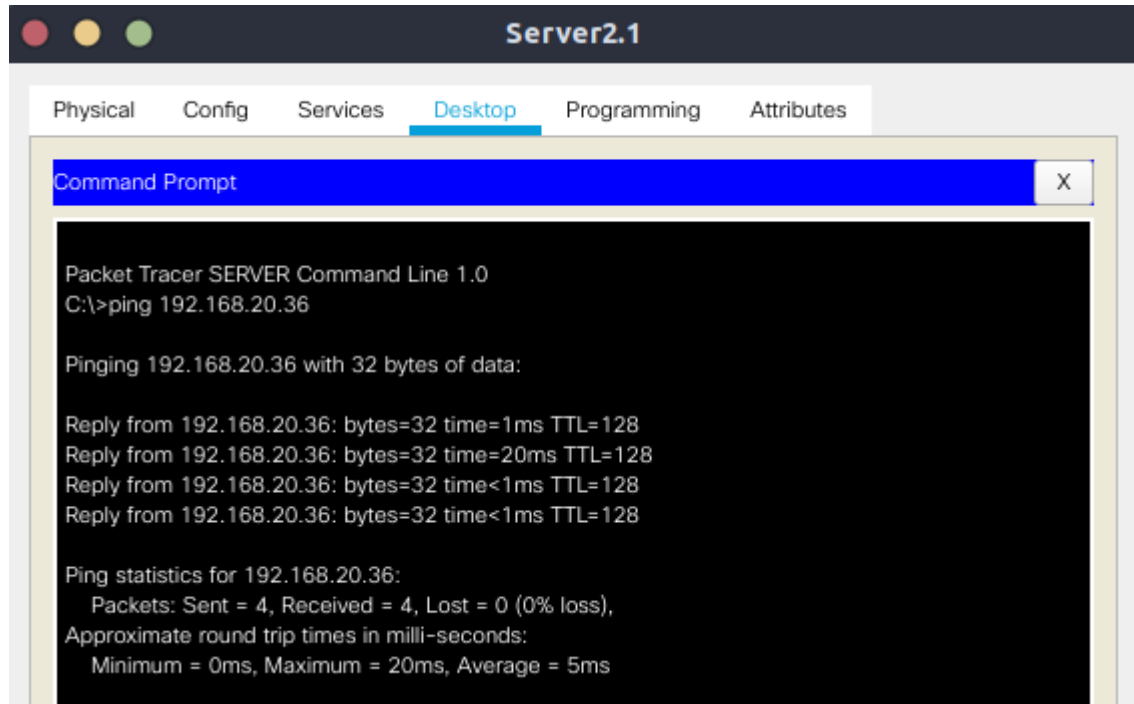
Настройка router1 в качестве DHCP-сервер:

```
Router(config-if)#ip dhcp pool subnet2
Router(dhcp-config)#network 192.168.20.32 255.255.255.224
Router(dhcp-config)#default-router 192.168.20.33
```

На хостах в подсети был запущен DHCP. Пример для Server2.1:



Проверка связи между Server2.1 и Server2.3:



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Настройка в качестве в качестве DHCP сервера маршрутизатор 2 для подсети 4

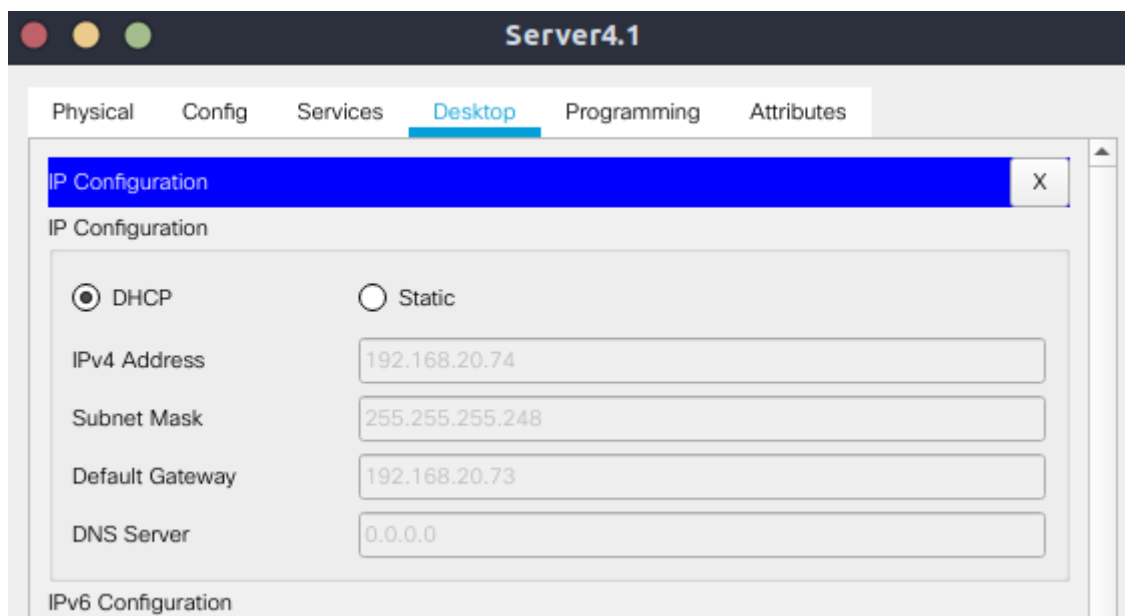
Настройка router 2:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Gig0/0/1
Router(config-if)#ip address 192.168.20.73 255.255.255.248
Router(config-if)#no sh
```

Настройка router2 в качестве DHCP-сервер:

```
Router(config-if)#ip dhcp pool subnet4
Router(dhcp-config)#network 192.168.20.72 255.255.255.248
Router(dhcp-config)#default-router 192.168.20.73
```

На хостах в подсети был запущен DHCP. Пример для Server4.1:



Проверка связи между Server4.1 и Server4.3:

```
C:\>ping 192.168.20.76

Pinging 192.168.20.76 with 32 bytes of data:

Reply from 192.168.20.76: bytes=32 time=2ms TTL=128
Reply from 192.168.20.76: bytes=32 time<1ms TTL=128
Reply from 192.168.20.76: bytes=32 time<1ms TTL=128
Reply from 192.168.20.76: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.20.76:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 1ms
```

4. Настройка в качестве DHCP сервера маршрутизатор 2 для подсети 5

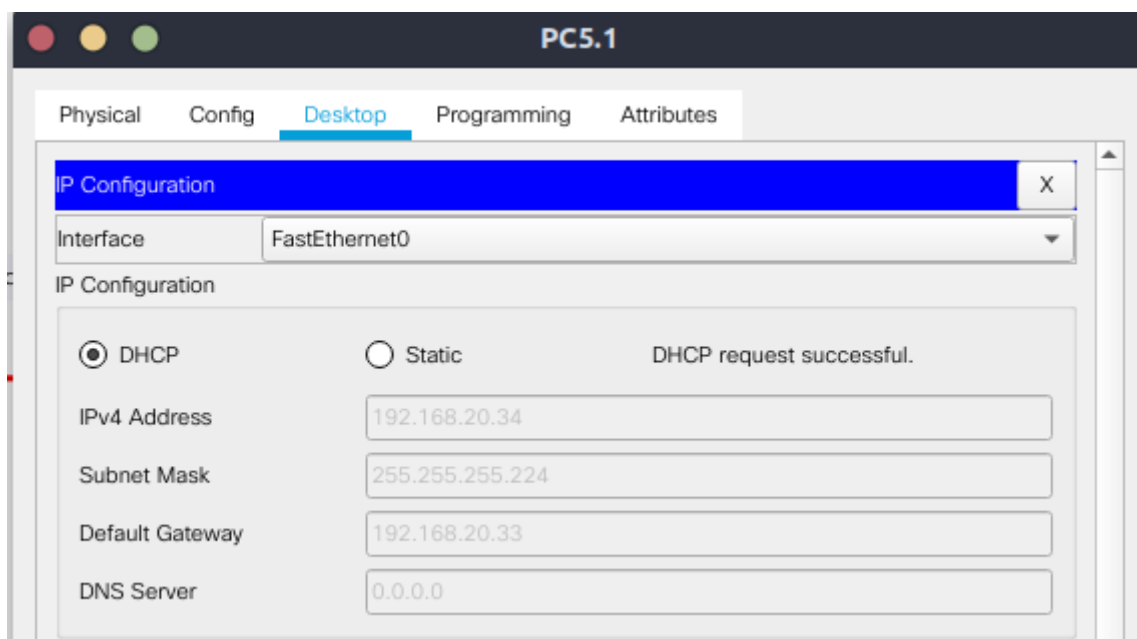
Настройка router 2:

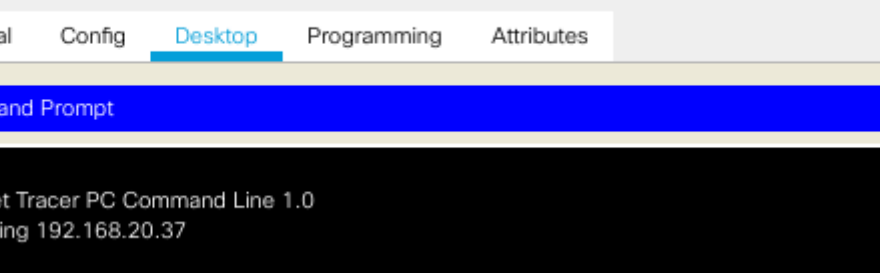
```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Gig0/0/0
Router(config-if)#ip address 192.168.20.33 255.255.255.224
Router(config-if)#no sh
```

Настройка router2 в качестве DHCP-сервер:

```
Router(config-if)#ip dhcp pool subnet5
Router(dhcp-config)#network 192.168.20.32 255.255.255.224
Router(dhcp-config)#default-router 192.168.20.33
```

На хостах в подсети был запущен DHCP. Пример для PC5.1:





The screenshot shows the PC5.1 configuration window in Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the command 'ping 192.168.20.37'. The output indicates a successful ping with 32 bytes of data, showing four replies from 192.168.20.37 with times less than 1ms and a TTL of 128. Ping statistics for 192.168.20.37 are also displayed, showing 4 packets sent, 4 received, and 0% loss.

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.20.37

Pinging 192.168.20.37 with 32 bytes of data:

Reply from 192.168.20.37: bytes=32 time=2ms TTL=128
Reply from 192.168.20.37: bytes=32 time<1ms TTL=128
Reply from 192.168.20.37: bytes=32 time<1ms TTL=128
Reply from 192.168.20.37: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.20.37:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

The image shows a screenshot of a Windows Server 4.1 desktop environment. The top of the window has a title bar with three colored buttons (red, yellow, green) and the text "Server4.1". Below the title bar is a menu bar with the following items: "Physical", "Config", "Services", "Desktop" (which is highlighted with a blue underline), "Programming", and "Attributes". The main area of the window is a black Command Prompt window with a blue title bar that says "Command Prompt" and a close button (X). The Command Prompt displays the following text:

Reply from 192.168.20.76: bytes=32 time<1ms TTL=128
Reply from 192.168.20.76: bytes=32 time<1ms TTL=128
Reply from 192.168.20.76: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.20.76:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>ping 192.168.20.37

Pinging 192.168.20.37 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.37: bytes=32 time=3ms TTL=127
Reply from 192.168.20.37: bytes=32 time<1ms TTL=127
Reply from 192.168.20.37: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.37:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>|

Настройка подсети 3

Настройка router1:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Se0/1/0
Router(config-if)#ip address 192.168.20.81 255.255.255.252
Router(config-if)#no sh
```

Настройка router2:

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Se0/1/0
Router(config-if)#ip address 192.168.20.82 255.255.255.252
Router(config-if)#no sh
```

Чтобы подсети маршрутизатора Router1 и подсети маршрутизатора Router2 находили друг друга, были выполнены следующие команды:

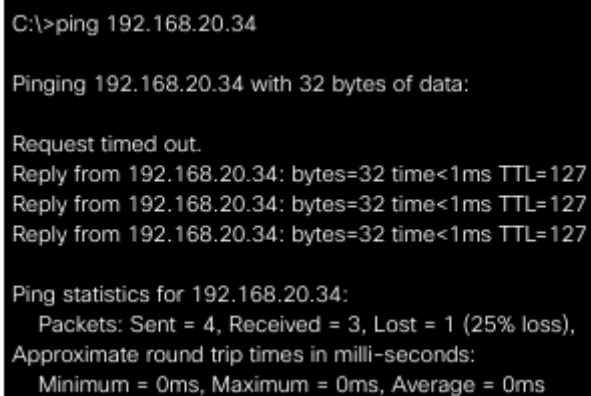
Для router1:

```
Router(config-if)#ip route 0.0.0.0 0.0.0.0 192.168.20.82
```

Для router2:

```
Router(config-if)#ip route 0.0.0.0 0.0.0.0 192.168.20.81
```

Проверка связи между подсети 1 и подсети 5 (PC1.1, PC5.1):



```
C:\>ping 192.168.20.34

Pinging 192.168.20.34 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.34: bytes=32 time<1ms TTL=127
Reply from 192.168.20.34: bytes=32 time<1ms TTL=127
Reply from 192.168.20.34: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.20.34:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```