

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

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Вариант 6

- Расчет подсетей

№ сети	К-во хостов в подсети	Сеть	Диапазон хостов	Широковещательный адрес	Маска
1	30	192.168.6.0	[192.168.6.1 - 192.168.6.30]	192.168.6.31	255.255.255.224 (27)
5	30	192.168.6.32	[192.168.6.33 - 192.168.6.62]	192.168.6.63	255.255.255.224 (27)
2	6	192.168.6.64	[192.168.6.65 - 192.168.6.70]	192.168.6.71	255.255.255.248 (29)
4	6	192.168.6.72	[192.168.6.73 - 192.168.6.78]	192.168.6.79	255.255.255.248 (29)
3	2	192.168.6.80	[192.168.6.81 - 192.168.6.82]	192.168.6.83	255.255.255.252 (30)

- Настройка DHCP-сервера для выдачи адресов

1. Настройка DHCP-сервер для подсети 1

router1:

```
Router1
Physical Config CLI Attributes
IOS Command Line Interface
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.

cisco ISR4321/K9 (1RU) processor with 1687137K/6147K bytes of memory.
Processor board ID FLM2041W2HD
2 Gigabit Ethernet interfaces
2 Serial interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.

Press RETURN to get started!

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 192.168.6.1 255.255.255.224
^
% Invalid input detected at '^' marker.

Router(config-if)#ip address 192.168.6.1 255.255.255.224
Router(config-if)#no sh

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
```

Настройка DHCP-сервера:

DHCP server

PhysicalConfigServicesDesktopProgrammingAttributes

IP ConfigurationX

IP Configuration

DHCP

Static

IPv4 Address

192.168.20.2

Subnet Mask

255.255.255.224

Default Gateway

192.168.20.1

DNS Server

0.0.0.0

DHCP server

PhysicalConfigServicesDesktopProgrammingAttributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DHCP

InterfaceFastEthernet0ServiceOnOff

Pool Name

serverPool

Default Gateway

192.168.6.1

DNS Server

0.0.0.0

Start IP Address :

192

168

6

3

Subnet Mask:

255

255

255

224

Maximum Number of Users :

29

TFTP Server:

0.0.0.0

WLC Address:

0.0.0.0

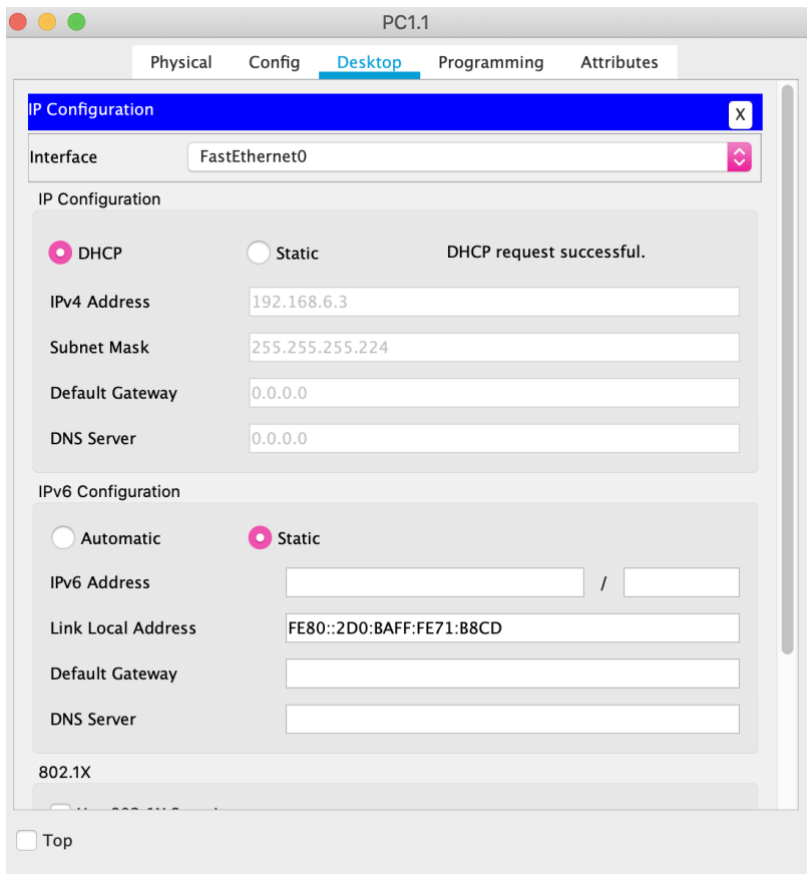
Add

Save

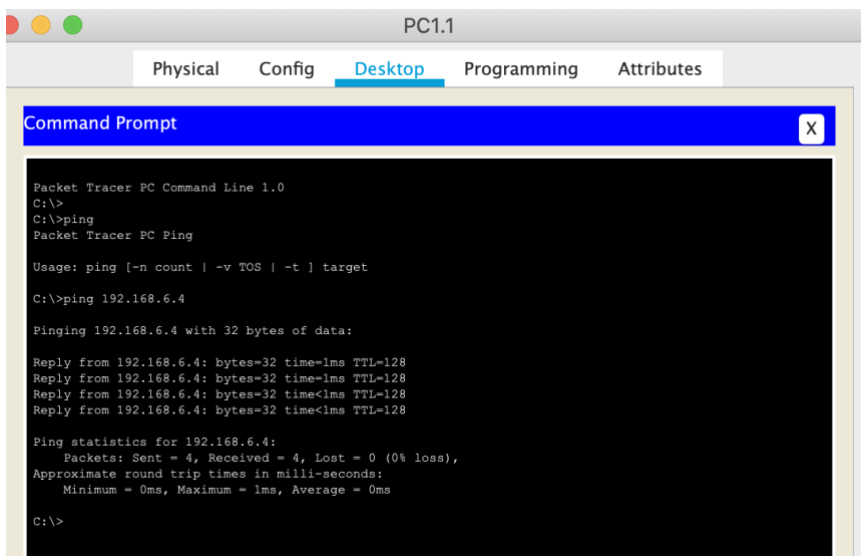
Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max Users	TFTP Server	WLC Address
serverPool	0.0.0.0	0.0.0.0	192...	255...	...	0.0.0.0	0.0.0.0

На хостах в подсети был запущен DHCP. Пример для PC1.1:

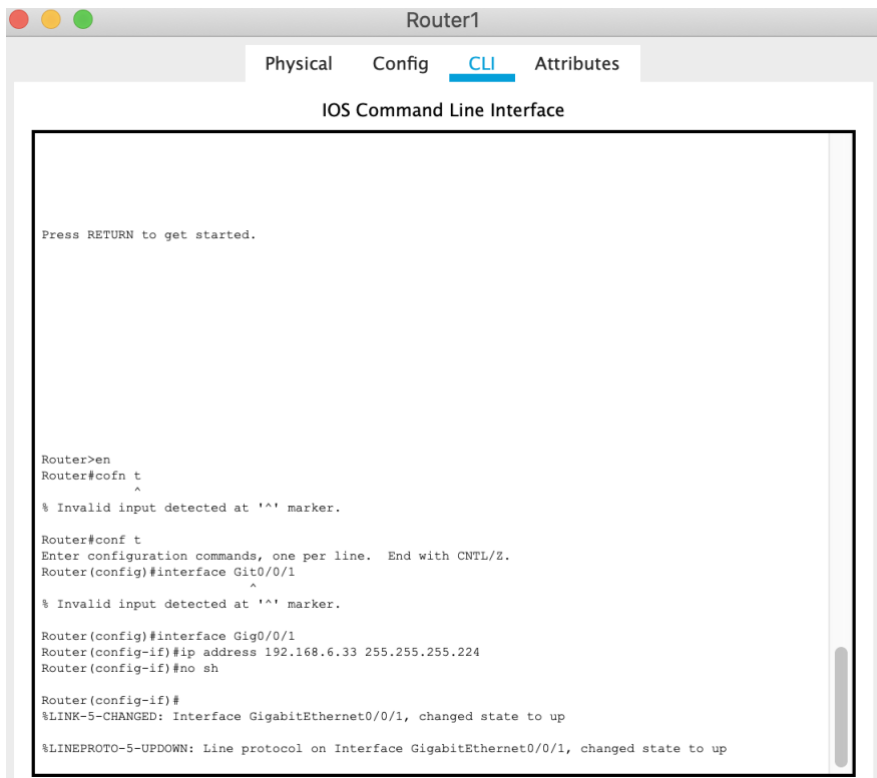


Проверка связи между PC1.1 и PC1.2:

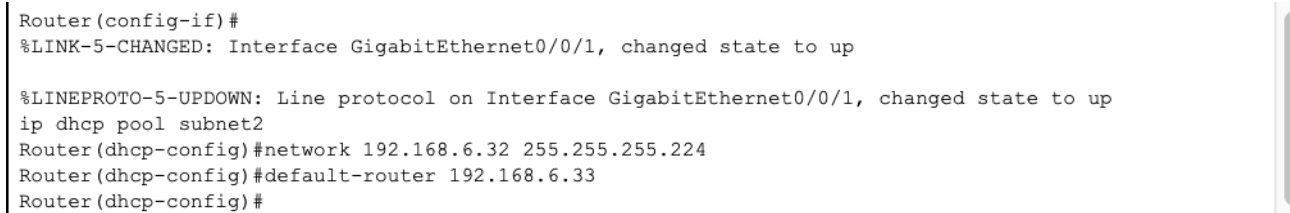


2. Настройка в качестве DHCP сервера маршрутизатор 1 для подсети 2

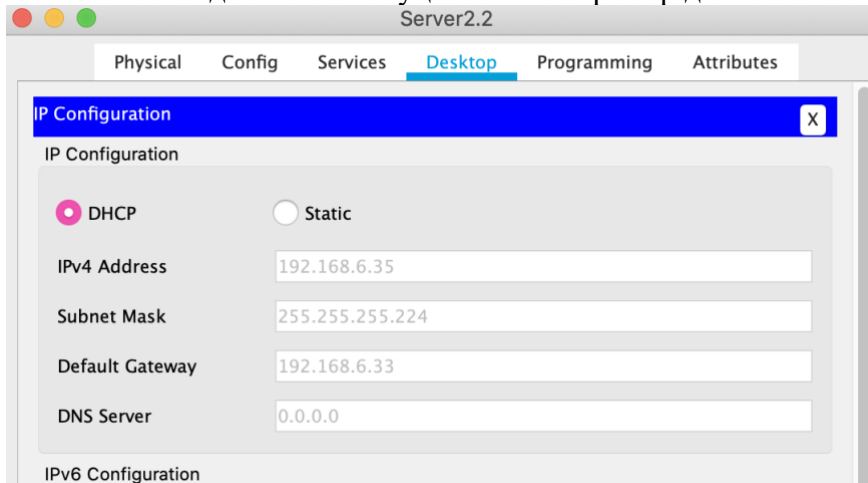
Настройка router1:



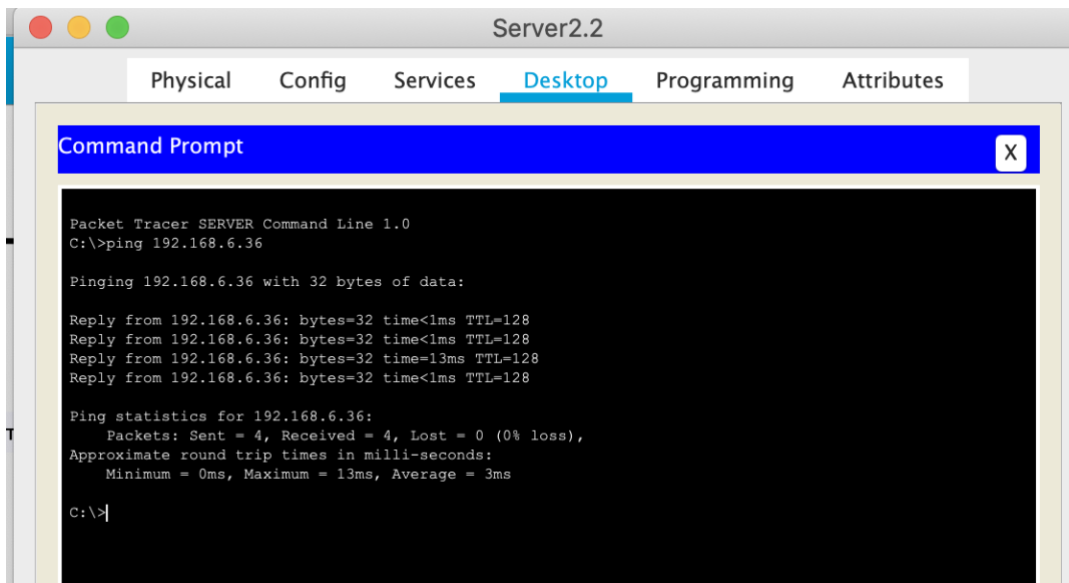
Настройка router1 в качестве DHCP-сервер:



На хостах в подсети был запущен DHCP. Пример для Server 2.2:

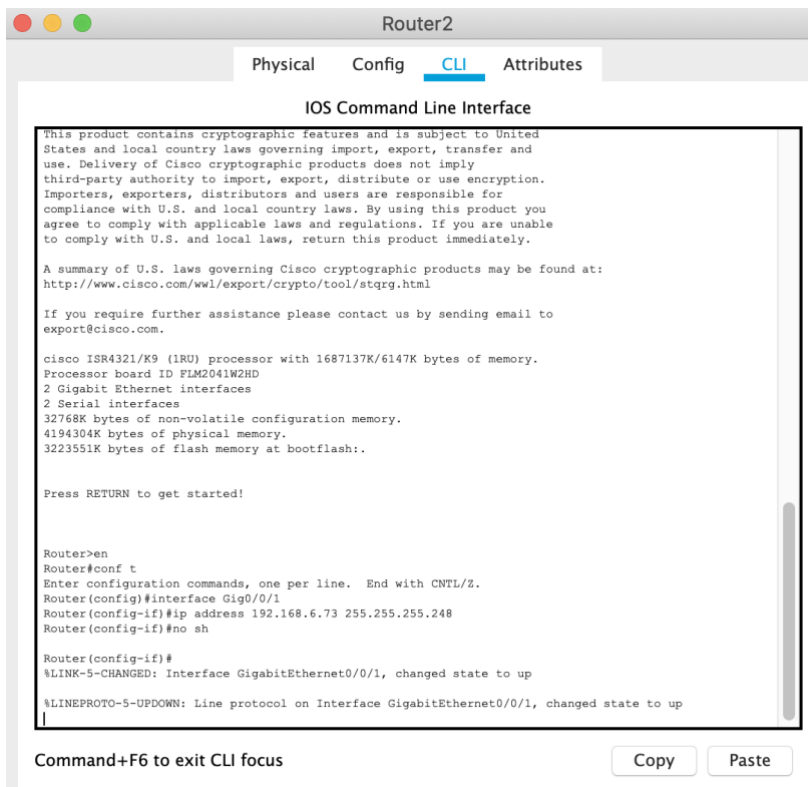


Проверка связи между Server2.2 и Server2.3:



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

Настройка router 2:



Настройка router2 в качестве DHCP-сервер:

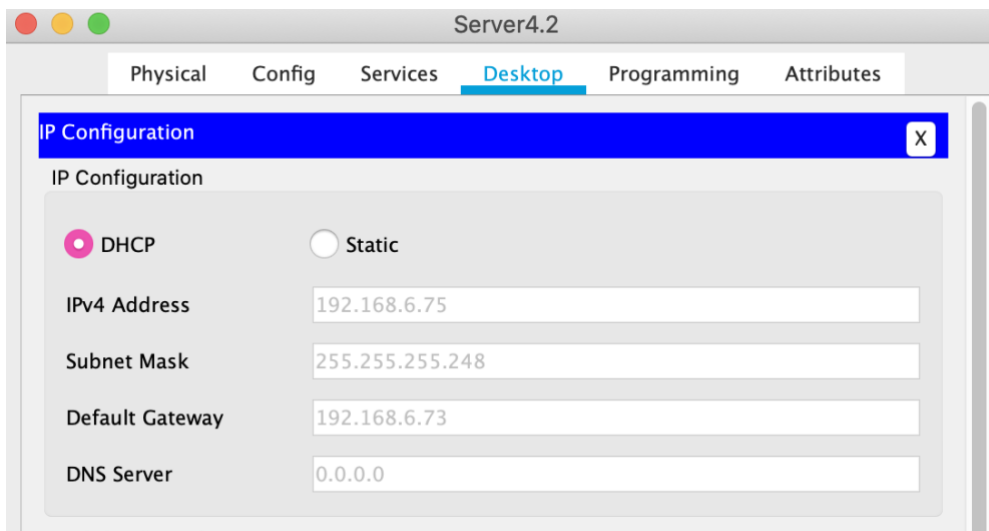
```
Router(config-if)#  
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up  
  
Router(config-if)#ip dhcp pool subnet4  
Router(dhcp-config)#network 192.168.6.72 255.255.255.248  
Router(dhcp-config)#default-router 192.168.6.73  
Router(dhcp-config)#
```

Command+F6 to exit CLI focus

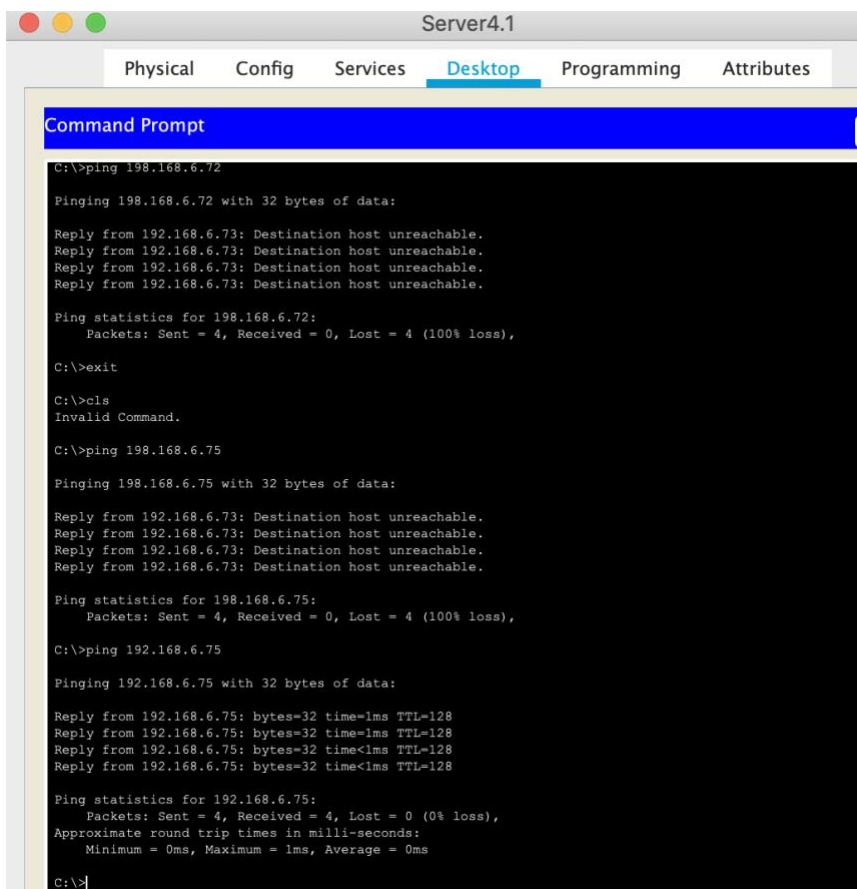
Copy

Paste

На хостах в подсети был запущен DHCP. Пример для Server4.2:



Проверка связи между Server4.1 и Server4.2:



```
Cr:\>ping 198.168.6.72

Pinging 198.168.6.72 with 32 bytes of data:

Reply from 192.168.6.73: Destination host unreachable.
Reply from 192.168.6.73: Destination host unreachable.
Reply from 192.168.6.73: Destination host unreachable.
Reply from 192.168.6.73: Destination host unreachable.

Ping statistics for 198.168.6.72:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>exit

C:\>cls
Invalid Command.

C:\>ping 198.168.6.75

Pinging 198.168.6.75 with 32 bytes of data:

Reply from 192.168.6.73: Destination host unreachable.
Reply from 192.168.6.73: Destination host unreachable.
Reply from 192.168.6.73: Destination host unreachable.
Reply from 192.168.6.73: Destination host unreachable.

Ping statistics for 198.168.6.75:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.6.75

Pinging 192.168.6.75 with 32 bytes of data:

Reply from 192.168.6.75: bytes=32 time=1ms TTL=128
Reply from 192.168.6.75: bytes=32 time=1ms TTL=128
Reply from 192.168.6.75: bytes=32 time<1ms TTL=128
Reply from 192.168.6.75: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.6.75:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>|
```

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

Настройка router 2:



```
Router2

Physical  Config  CLI  Attributes

IOS Command Line Interface

Router con0 is now available

Press RETURN to get started.

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 192.168.6.33 255.255.255.224
Router(config-if)#no sh

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
|
```

Настройка router2 в качестве DHCP-сервер:

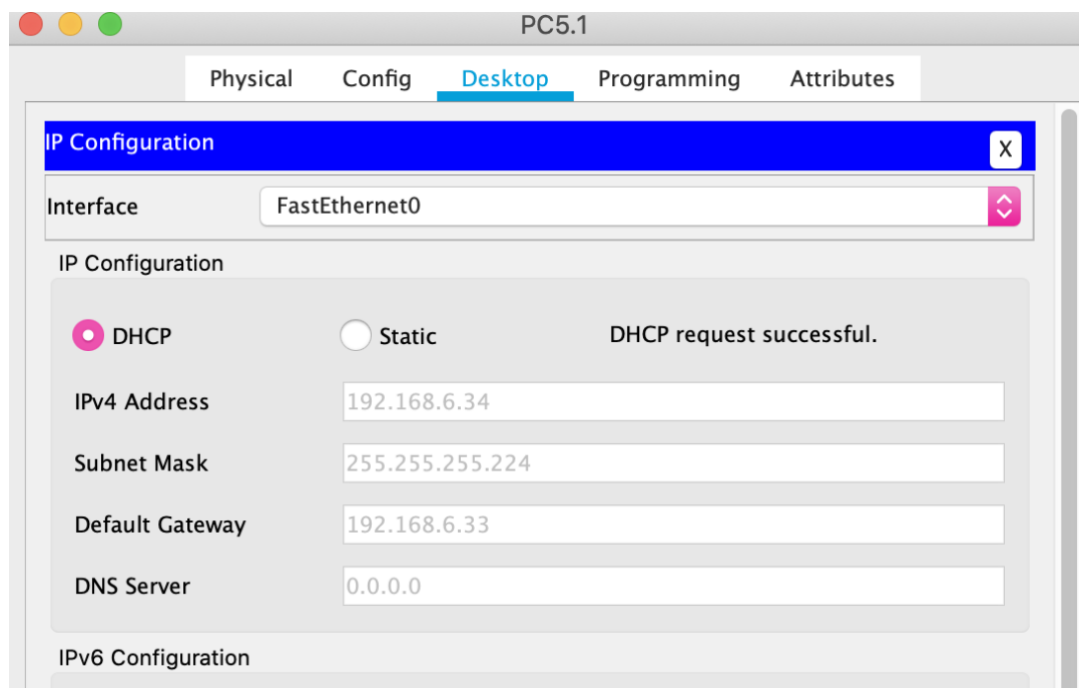
```
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up

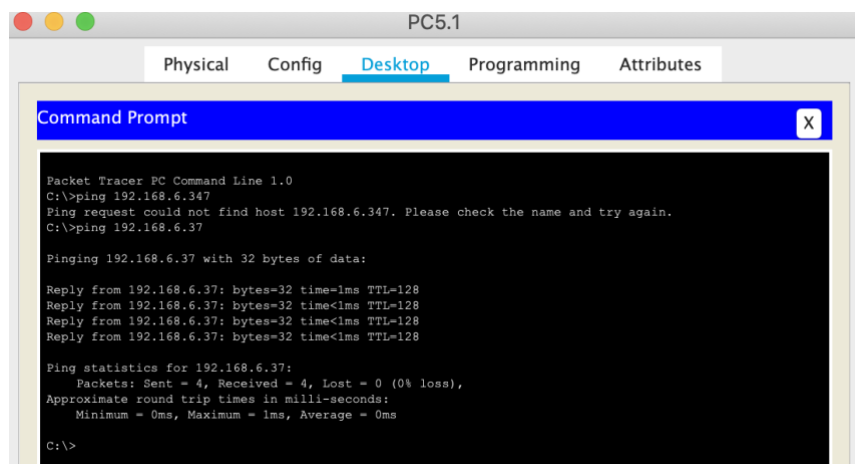
Router(config-if)#ip dhcp pool subnet5
Router(dhcp-config)#network 192.168.6.32 255.255.255.224
Router(dhcp-config)#default-router 192.168.6.33
Router(dhcp-config)#
^
% Invalid input detected at '^' marker.

Router(dhcp-config)#default-router 192.168.6.33
Router(dhcp-config)#
```

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

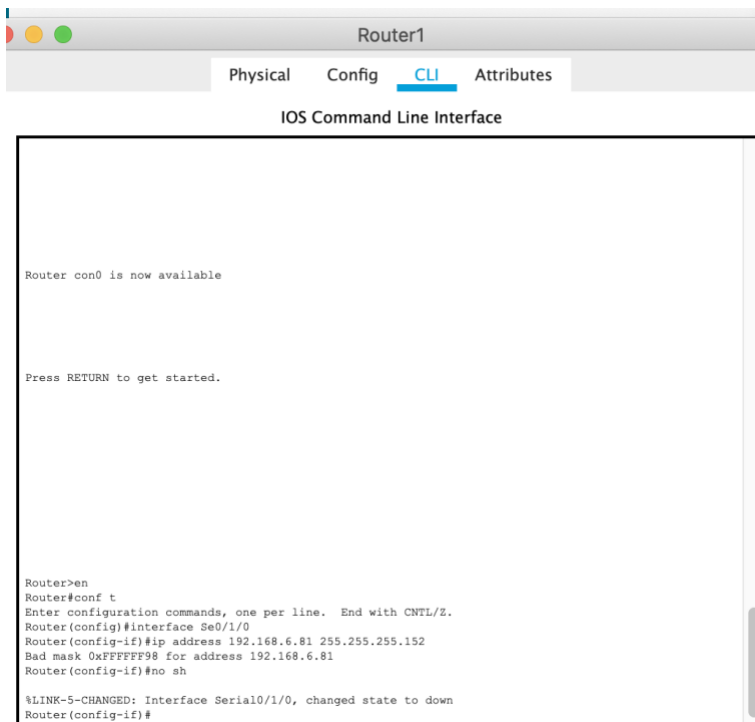


Проверка связи между PC5.1 и PC5.4:



5. Настройка подсети 3

Настройка router1:



The screenshot shows the CLI interface of Router1. The window title is 'Router1'. There are four tabs: 'Physical', 'Config', 'CLI' (which is selected and highlighted in blue), and 'Attributes'. Below the tabs, the text 'IOS Command Line Interface' is displayed. The main area contains the following text:

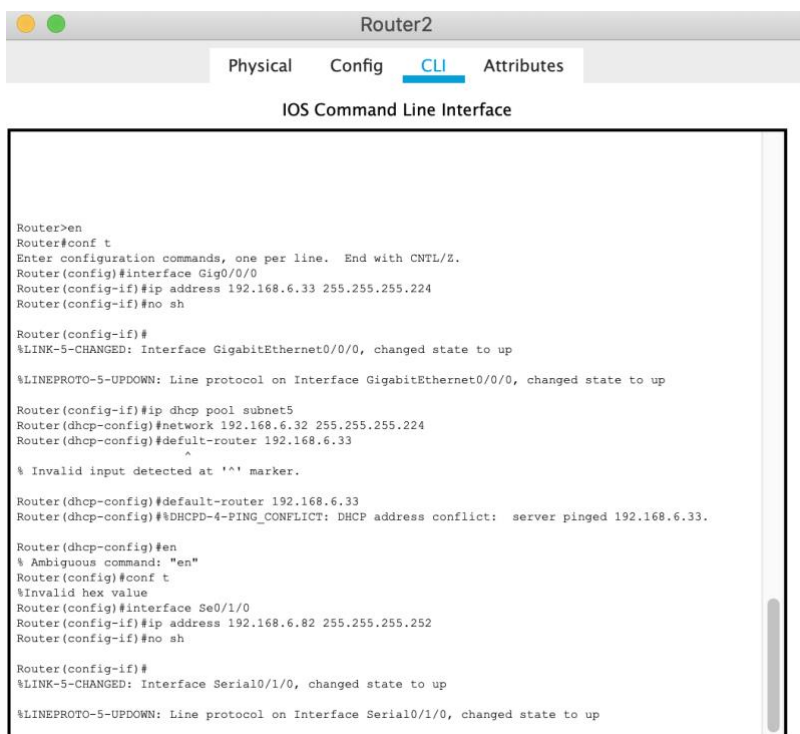
```
Router con0 is now available

Press RETURN to get started.

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 192.168.6.81 255.255.255.152
Bad mask 0xFFFFF98 for address 192.168.6.81
Router(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#
```

Настройка router2:



The screenshot shows the CLI interface of Router2. The window title is 'Router2'. There are four tabs: 'Physical', 'Config', 'CLI' (which is selected and highlighted in blue), and 'Attributes'. Below the tabs, the text 'IOS Command Line Interface' is displayed. The main area contains the following text:

```
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 192.168.6.33 255.255.255.224
Router(config-if)#no sh

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up

Router(config-if)#ip dhcp pool subnet5
Router(dhcp-config)#network 192.168.6.32 255.255.255.224
Router(dhcp-config)#default-router 192.168.6.33
^
% Invalid input detected at '^' marker.

Router(dhcp-config)#default-router 192.168.6.33
Router(dhcp-config)%%DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged 192.168.6.33.

Router(dhcp-config)#en
% Ambiguous command: "en"
Router(config)#conf t
%Invalid hex value
Router(config)#interface Se0/1/0
Router(config-if)#ip address 192.168.6.82 255.255.255.252
Router(config-if)#no sh

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
```

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

Для router1:

```
Router(config)#ip route 0.0.0.0 0.0.0.0 192.168.6.82
Router(config)#
```

Для router2:

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
ip route 0.0.0.0 0.0.0.0 192.168.6.81
Router(config)#
```