МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

федеральное государственное бюджетное образовательное учреждение высшего образования

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Московский приборостроительный техникум

ЛАБОРАТОРНАЯ РАБОТА №8

Тема: «Настройка топологии сети с использованием EIGRP»

МДК.01.02 «Организация, принципы построения и функционирования компьютерных сетей»

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Москва, 2024

Отчет о выполнении лабораторной работы по настройке топологии сети с использованием EIGRP.

1. Топология сети

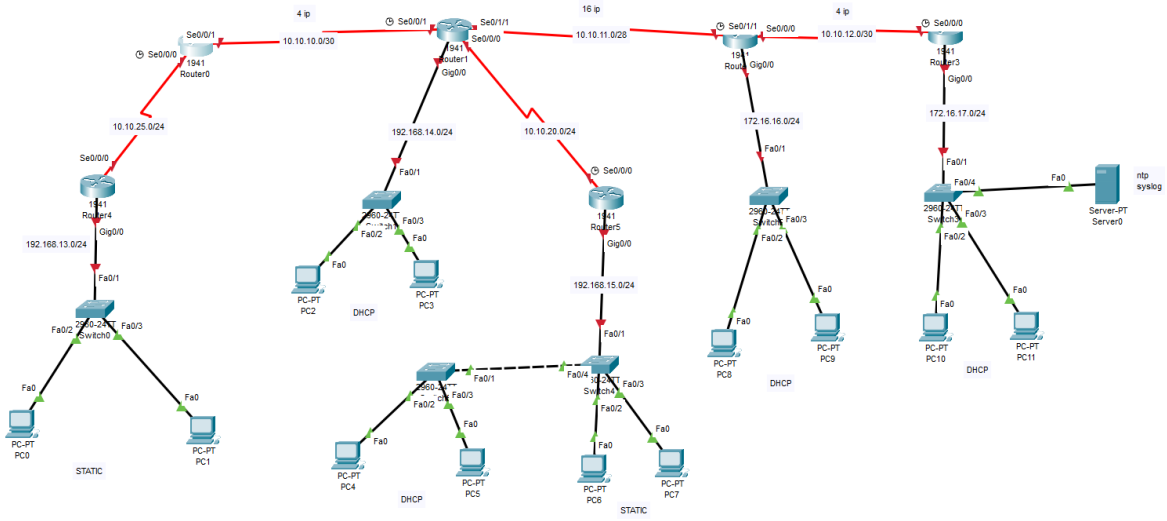

Рисунок 1 - топология сети

2. На рисунках изображена базовая настройка коммутатора и маршрутизатора.

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname KarpovR1
KarpovR1(config)#enable password cisco
KarpovR1(config)#username admin password cisco
KarpovR1(config)#line console 0
KarpovR1(config-line)#password cisco
KarpovR1(config-line)#login
KarpovR1(config-line)#line vty 0 15
KarpovR1(config-line)#password cisco
KarpovR1(config-line)#login
KarpovR1(config-line)#transport input all
KarpovR1(config-line)#service password-encryption
KarpovR1(config)#banner motd "Hello R1"
KarpovR1(config)#
```

Рисунок 2 - базз настройка маршрутизатора

Москва, 2024

```
Switch>en
Switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname KarpovS1
KarpovS1(config)#enable password cisco
KarpovS1(config)#username admin password cisco
KarpovS1(config)#line console 0
KarpovS1(config-line)#password cisco
KarpovS1(config-line)#login
KarpovS1(config-line)#line vty 0 15
KarpovS1(config-line)#password cisco
KarpovS1(config-line)#login
KarpovS1(config-line)#transport input all
KarpovS1(config-line)#service password-encryption
KarpovS1(config)#banner motd "Hello S1"
KarpovS1(config)#
```

Рисунок 3 - базз настройка коммутатора

3. Настройка сети 10.10.25.0/24

```
KarpovR1(config)#interface Serial0/0/0
KarpovR1(config-if)#ip add 10.10.25.1 255.255.255.0
KarpovR1(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
KarpovR1(config-if)#
```

Рисунок 4 - роутер r1

```
KarpovR2(config)#interface Serial0/0/0
KarpovR2(config-if)#ip add 10.10.25.2 255.255.255.0
KarpovR2(config-if)#no sh

KarpovR2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

KarpovR2(config-if)#
```

Рисунок 5 - роутер r2

4. Настройка сети 192.168.13.0/24 static ip

```
KarpovR2(config)#int g0/0
KarpovR2(config-if)#ip add 192.168.13.1 255.255.255.0
KarpovR2(config-if)#no sh

KarpovR2(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

KarpovR2(config-if)#
```

Рисунок 6 - роутер r2

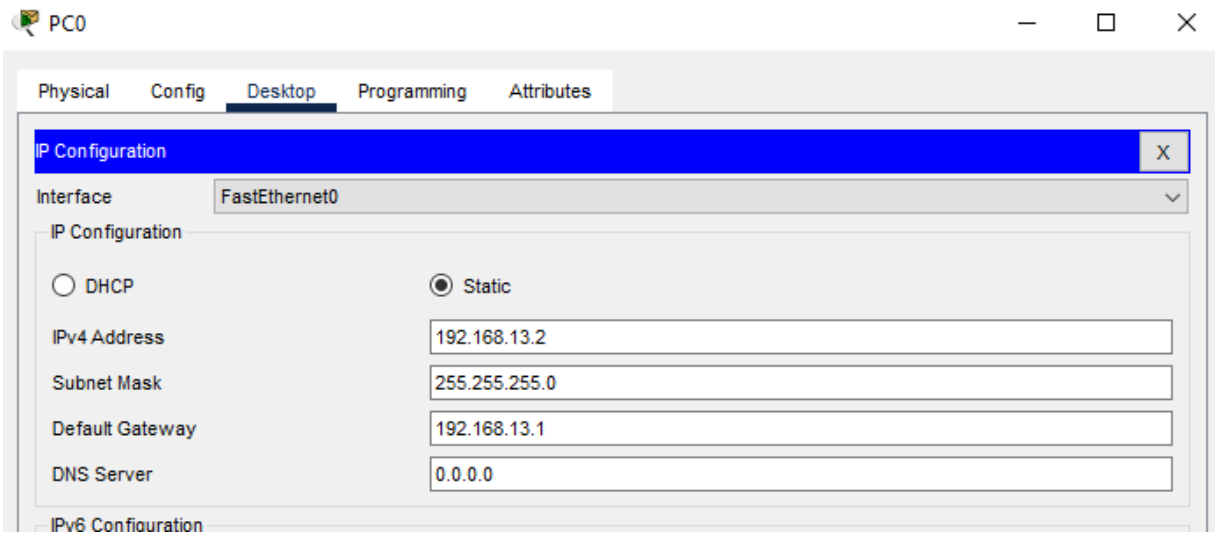

Рисунок 7 - static ip для пк

5. Настройка сети 192.168.14.0/24 DHCP

```
KarpovR3(config)#int g0/0
KarpovR3(config-if)#ip add 192.168.14.1 255.255.255.0
KarpovR3(config-if)#no sh

KarpovR3(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

KarpovR3(config-if)#ip dhcp pool one
KarpovR3(dhcp-config)#net
KarpovR3(dhcp-config)#network 192.168.14.0 255.255.255.0
KarpovR3(dhcp-config)#def
KarpovR3(dhcp-config)#default-router 192.168.14.1
KarpovR3(dhcp-config)#ex
KarpovR3(config)#ip dhcp ex
KarpovR3(config)#ip dhcp excluded-address 192.168.14.1
KarpovR3(config)#
```

Рисунок 8 - dhcp r3

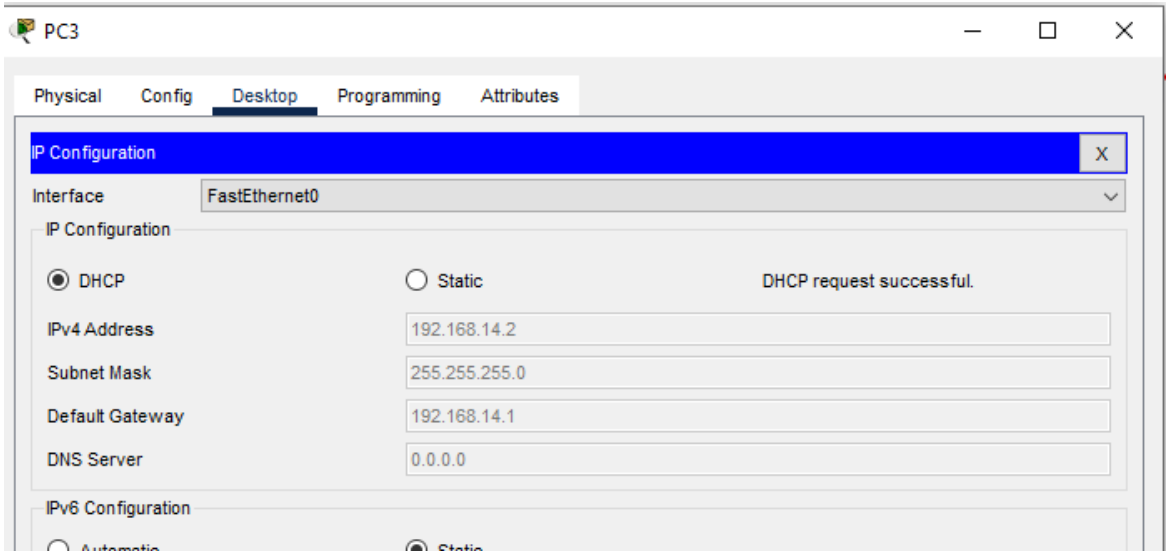

Рисунок 9 - проверка dhcp на пк

6. Настройка сети 10.10.20.0/24

```
KarpovR3(config)#interface Serial0/0/0
KarpovR3(config-if)#ip add 10.10.20.1 255.255.255.0
KarpovR3(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
KarpovR3(config-if)#
```

Рисунок 10 - роутер r3

```
KarpovR4(config)#interface Serial0/0/0
KarpovR4(config-if)#ip add 10.10.20.2 255.255.255.0
KarpovR4(config-if)#no sh

KarpovR4(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

KarpovR4(config-if)#
```

Рисунок 11 - роутер r4

7. Настройка 192.168.15.0/24 DHCP и Static для компьютеров

```
KarpovR4(config)#int g0/0
KarpovR4(config-if)#ip add 192.168.15.1 255.255.255.0
KarpovR4(config-if)#no sh

KarpovR4(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

KarpovR4(config-if)#ip dhcp pool two
KarpovR4(dhcp-config)#network 192.168.15.0 255.255.255.0
KarpovR4(dhcp-config)#def
KarpovR4(dhcp-config)#default-router 192.168.15.1
KarpovR4(dhcp-config)#ex
KarpovR4(config)#ip dhcp ex
KarpovR4(config)#ip dhcp excluded-address 192.168.15.1
KarpovR4(config)#
```

Рисунок 12 - dhcp r4

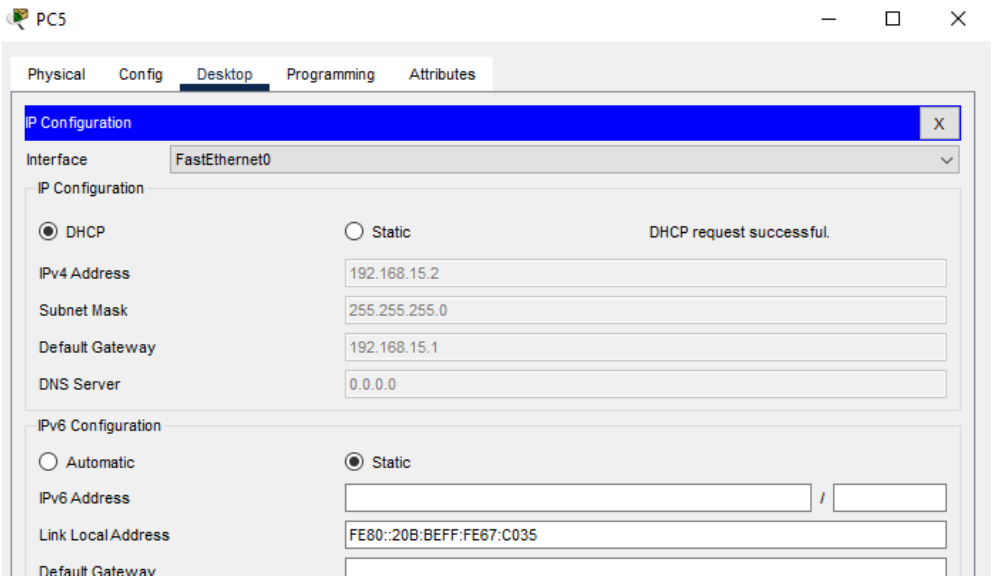

Рисунок 13 - проверка dhcp

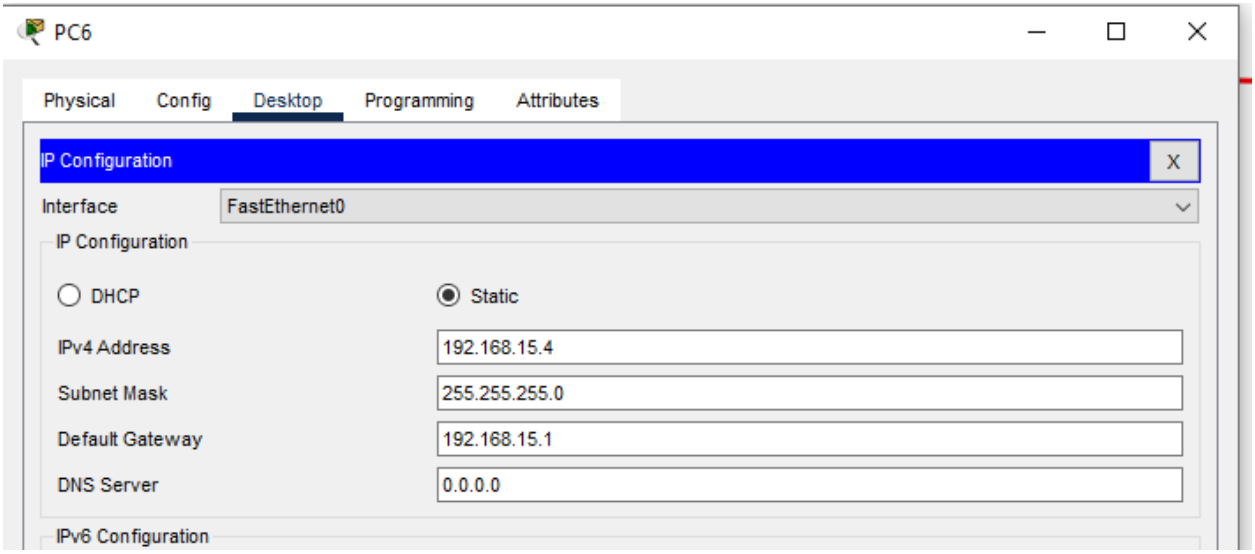

Рисунок 14 - настройка static для пк

8. Настройка сети 172.16.16.0/24 DHCP

```
KarpovR5(config)#int g0/0
KarpovR5(config-if)#ip add 172.16.16.1 255.255.255.0
KarpovR5(config-if)#no sh

KarpovR5(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

KarpovR5(config-if)#ip dhcp pool three
KarpovR5(dhcp-config)#net
KarpovR5(dhcp-config)#network 172.16.16.0 255.255.255.0
KarpovR5(dhcp-config)#def
KarpovR5(dhcp-config)#default-router 172.16.16.1
KarpovR5(dhcp-config)#ex
KarpovR5(config)#ip dhcp ex
KarpovR5(config)#ip dhcp excluded-address 172.16.16.1
KarpovR5(config)#
```

Рисунок 15 - dhcp r5

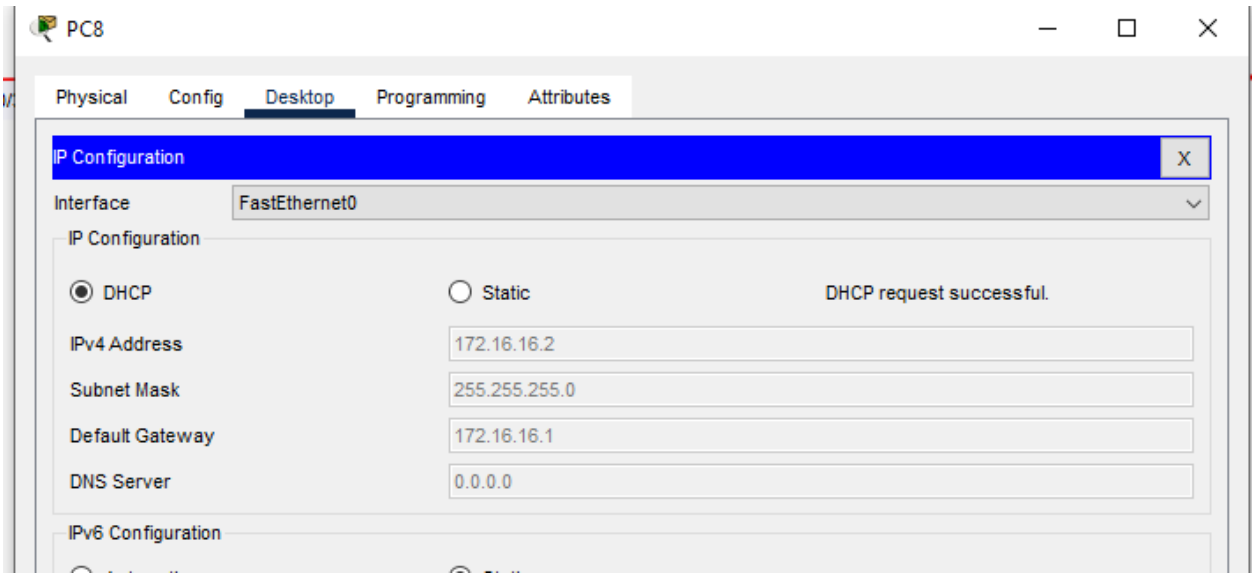

Рисунок 16 - проверка dhcp

9. Настройка сети 172.16.17.0/24 DHCP и Server

```
Enter configuration commands, one per line.  End with CNTL/Z.
KarpovR6(config)#int g0/0
KarpovR6(config-if)#ip add 172.16.17.1 255.255.255.0
KarpovR6(config-if)#no sh

KarpovR6(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

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

KarpovR6(config-if)#ip dhcp pool four
KarpovR6(dhcp-config)#net
KarpovR6(dhcp-config)#network 172.16.17.0 255.255.255.0
KarpovR6(dhcp-config)#def
KarpovR6(dhcp-config)#default-router 172.16.17.1
KarpovR6(dhcp-config)#ex
KarpovR6(config)#ip dhcp ex
KarpovR6(config)#ip dhcp excluded-address 172.16.17.1
KarpovR6(config)#
```

Рисунок 17 - dhcp r6

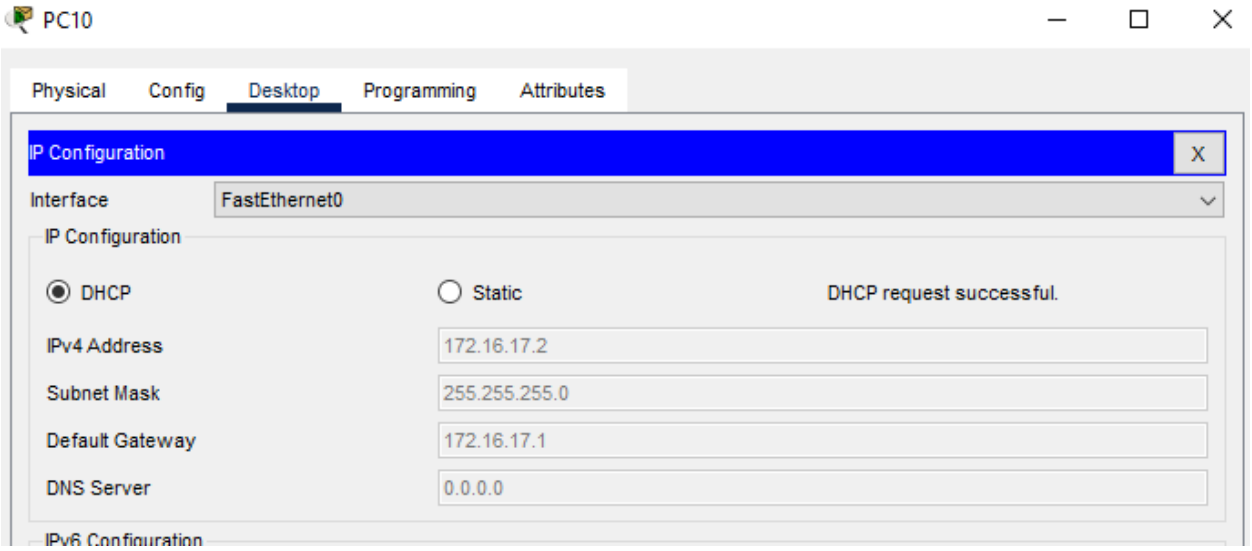

Рисунок 18 - проверка dhcp

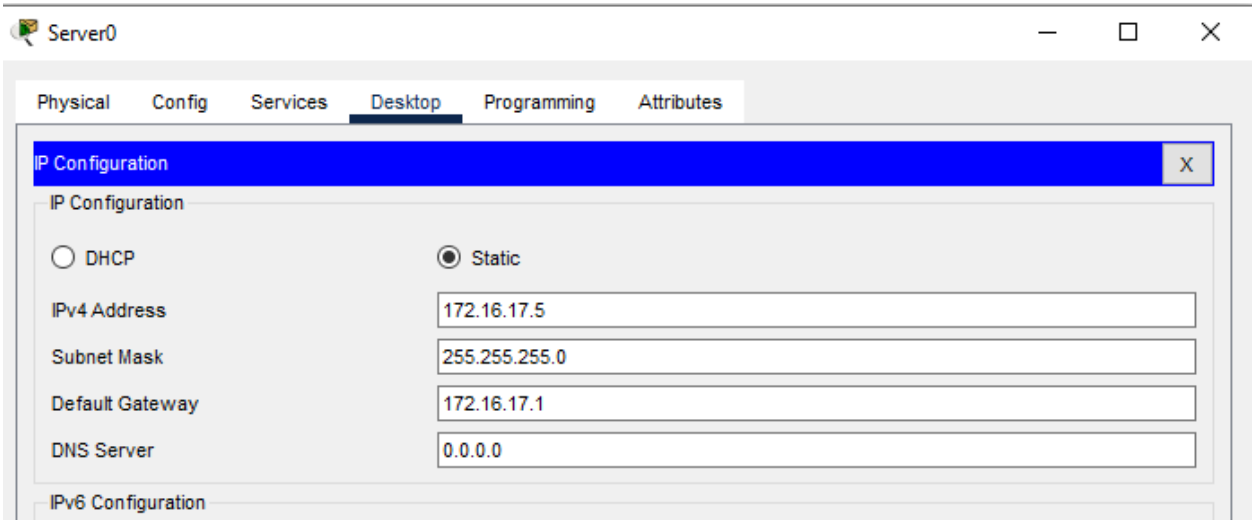

Рисунок 19 - ip адрес для сервера

10. Настройка сети 10.10.10.0/30 на 4 ip адреса

```
Enter configuration commands, one per line.  End with CNTL/Z.
KarpovR1(config)#KarpovR1(config)#
KarpovR1(config)#interface Serial0/0/1
KarpovR1(config-if)#ip add 10.10.10.1 255.255.255.252
KarpovR1(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
KarpovR1(config-if)#
```

Рисунок 20 - роутер r1

```
KarpovR3(config)#interface Serial0/0/1
KarpovR3(config-if)#ip add 10.10.10.2 255.255.255.252
KarpovR3(config-if)#no sh

KarpovR3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

KarpovR3(config-if)#
```

Рисунок 21 - роутер r5

11. Настройка сети 10.10.11.0/28 на 16 ip адресов

```
KarpovR3(config)#interface Serial0/1/1
KarpovR3(config-if)#10.10.11.1 255.255.255.240
                   ^
% Invalid input detected at '^' marker.

KarpovR3(config-if)#ip add 10.10.11.1 255.255.255.240
KarpovR3(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/1/1, changed state to down
KarpovR3(config-if)#
```

Рисунок 22 - роутер r3

```
KarpovR5(config-if)#ip add 10.10.11.2 255.255.255.240
KarpovR5(config-if)#no sh

KarpovR5(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

KarpovR5(config-if)#
```

Рисунок 23 - роутер r5

12. Настройка сети 10.10.12.0/30 на 4 ip адреса

```
KarpovR5(config)#interface Serial0/0/0
KarpovR5(config-if)#ip add 10.10.12.1 255.255.255.252
KarpovR5(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
KarpovR5(config-if)#
```

Рисунок 24- роутер r5

```
KarpovR6(config)#interface Serial0/0/0
KarpovR6(config-if)#ip add 10.10.12.2 255.255.255.252
KarpovR6(config-if)#no sh

KarpovR6(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

KarpovR6(config-if)#
```

Рисунок 25 - роутер r6

13. Настройка EIGRP на всех маршрутизаторах

```
KarpovR2(config)#router eigrp 1
KarpovR2(config-router)#net
KarpovR2(config-router)#network 192.168.13.0
KarpovR2(config-router)#10.10.25.0
                        ^
% Invalid input detected at '^' marker.

KarpovR2(config-router)#network 10.10.25.0
KarpovR2(config-router)#
```

Рисунок 26 - EIGRP для r2

```
KarpovR1(config)#router e
KarpovR1(config)#router eigrp 1
KarpovR1(config-router)#net
KarpovR1(config-router)#network 10.10.10.0
KarpovR1(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.25.2 (Serial0/0/0) is up: new adjacency

KarpovR1(config-router)#net
KarpovR1(config-router)#network 10.10.25.0
KarpovR1(config-router)#
```

Рисунок 27 - EIGRP для r1

```
KarpovR3(config)#router e
KarpovR3(config)#router eigrp 1
KarpovR3(config-router)#net
KarpovR3(config-router)#network 10.10.10.0
KarpovR3(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.10.1 (Serial0/0/1) is up: new adjacency

KarpovR3(config-router)#net
KarpovR3(config-router)#network 10.10.11.0
KarpovR3(config-router)#net
KarpovR3(config-router)#network 192.168.14.0
KarpovR3(config-router)#network 10.10.20.0
KarpovR3(config-router)#
```

Рисунок 28 - EIGRP для r3

```
KarpovR4(config)#router e
KarpovR4(config)#router eigrp 1
KarpovR4(config-router)#net
KarpovR4(config-router)#network 10.10.20.0
KarpovR4(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.20.1 (Serial0/0/0) is up: new adjacency

KarpovR4(config-router)#network 192.168.15.0
KarpovR4(config-router)#
```

Рисунок 29 - EIGRP для r4

```
KarpovR5(config)#router e
KarpovR5(config)#router eigrp 1
KarpovR5(config-router)#network 10.10.11.0
KarpovR5(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.11.1 (Serial0/1/1) is up: new adjacency

KarpovR5(config-router)#network 10.10.12.0
KarpovR5(config-router)#network 172.16.16.0
KarpovR5(config-router)#
```

Рисунок 30 - EIGRP для r5

```
KarpovR6(config)#router e
KarpovR6(config)#router eigrp 1
KarpovR6(config-router)#network 10.10.12.0
KarpovR6(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.12.1 (Serial0/0/0) is up: new adjacency

KarpovR6(config-router)#network 172.16.17.0
KarpovR6(config-router)#
```

Рисунок 31 - EIGRP для r6

14. Проверка пинг из 192.168.13.2 в 172.16.17.2

```
C:\>ping 172.16.17.2

Pinging 172.16.17.2 with 32 bytes of data:

Reply from 172.16.17.2: bytes=32 time=38ms TTL=123
Reply from 172.16.17.2: bytes=32 time=37ms TTL=123
Reply from 172.16.17.2: bytes=32 time=4ms TTL=123
Reply from 172.16.17.2: bytes=32 time=4ms TTL=123

Ping statistics for 172.16.17.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 4ms, Maximum = 38ms, Average = 20ms

C:\>
```

Рисунок 32 - проверка работоспособности

15. Настройка ssh на всех маршрутизаторах

```
KarpovR2(config)#Line vty 0 15
KarpovR2(config-line)#Login local
KarpovR2(config-line)#Transport input ssh
KarpovR2(config-line)#Username admin password cisco
KarpovR2(config)#ip domain-name cisco.com
KarpovR2(config)#Crypto key generate rsa
The name for the keys will be: KarpovR2.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

KarpovR2(config)#ip ssh v
*Mar 1 1:18:14.388: %SSH-5-ENABLED: SSH 1.99 has been enabled
KarpovR2(config)#ip ssh version 2
KarpovR2(config)#
```

Рисунок 33 - shh на r2

```
KarpovR1(config)#Line vty 0 15
KarpovR1(config-line)#Login local
KarpovR1(config-line)#Transport input ssh
KarpovR1(config-line)#Username admin password cisco
KarpovR1(config)#ip domain-name cisco.com
KarpovR1(config)#Crypto key generate rsa
The name for the keys will be: KarpovR1.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

KarpovR1(config)#ip ssh v
*Mar 1 1:18:57.987: %SSH-5-ENABLED: SSH 1.99 has been enabled
KarpovR1(config)#ip ssh version 2
KarpovR1(config)#
```

Рисунок 34- shh на r1

```
KarpovR3(config)#Line vty 0 15
KarpovR3(config-line)#Login local
KarpovR3(config-line)#Transport input ssh
KarpovR3(config-line)#Username admin password cisco
KarpovR3(config)#ip domain-name cisco.com
KarpovR3(config)#Crypto key generate rsa
The name for the keys will be: KarpovR3.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

KarpovR3(config)#ip ssh v
*Mar 1 1:19:11.941: %SSH-5-ENABLED: SSH 1.99 has been enabled
KarpovR3(config)#ip ssh version 2
KarpovR3(config)#
```

Рисунок 35- shh на r3

```
KarpovR4(config)#Line vty 0 15
KarpovR4(config-line)#Login local
KarpovR4(config-line)#Transport input ssh
KarpovR4(config-line)#Username admin password cisco
KarpovR4(config)#ip domain-name cisco.com
KarpovR4(config)#Crypto key generate rsa
The name for the keys will be: KarpovR4.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

KarpovR4(config)#ip ssh v
*Mar 1 1:19:29.827: %SSH-5-ENABLED: SSH 1.99 has been enabled
KarpovR4(config)#ip ssh version 2
KarpovR4(config)#
```

Рисунок 36- shh на r4

```
KarpovR5(config)#Line vty 0 15
KarpovR5(config-line)#Login local
KarpovR5(config-line)#Transport input ssh
KarpovR5(config-line)#Username admin password cisco
KarpovR5(config)#ip domain-name cisco.com
KarpovR5(config)#Crypto key generate rsa
The name for the keys will be: KarpovR5.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

KarpovR5(config)#ip ssh v
*Mar 1 1:19:43.971: %SSH-5-ENABLED: SSH 1.99 has been enabled
KarpovR5(config)#ip ssh version 2
KarpovR5(config)#
```

Рисунок 37- shh на r5

```
KarpovR6(config)#Line vty 0 15
KarpovR6(config-line)#Login local
KarpovR6(config-line)#Transport input ssh
KarpovR6(config-line)#Username admin password cisco
KarpovR6(config)#ip domain-name cisco.com
KarpovR6(config)#Crypto key generate rsa
The name for the keys will be: KarpovR6.cisco.com
Choose the size of the key modulus in the range of 360 to 2048 for your
  General Purpose Keys. Choosing a key modulus greater than 512 may take
  a few minutes.

How many bits in the modulus [512]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

KarpovR6(config)#ip ssh v
*Mar 1 1:20:0.411: %SSH-5-ENABLED: SSH 1.99 has been enabled
KarpovR6(config)#ip ssh version 2
KarpovR6(config)#
```

Рисунок 38- shh на r6

16. Проверка ssh на подключение

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l admin 10.10.10.1

Password:

Hello R1

KarpovR1>en
Password:
KarpovR1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
KarpovR1(config)#
```

Рисунок 39 - ssh проверка

17. Настройка syslog and ntp

```
KarpovR6(config)#ntp server 172.16.17.5
KarpovR6(config)#logging 172.16.17.5
KarpovR6(config)#logging trap debug
KarpovR6(config)#servece t
KarpovR6(config)#ser
KarpovR6(config)#service t
KarpovR6(config)#service timestamps l
KarpovR6(config)#service timestamps log d
KarpovR6(config)#service timestamps log datetime m
KarpovR6(config)#service timestamps log datetime msec
KarpovR6(config)#
```

Рисунок 40 - syslog, ntp

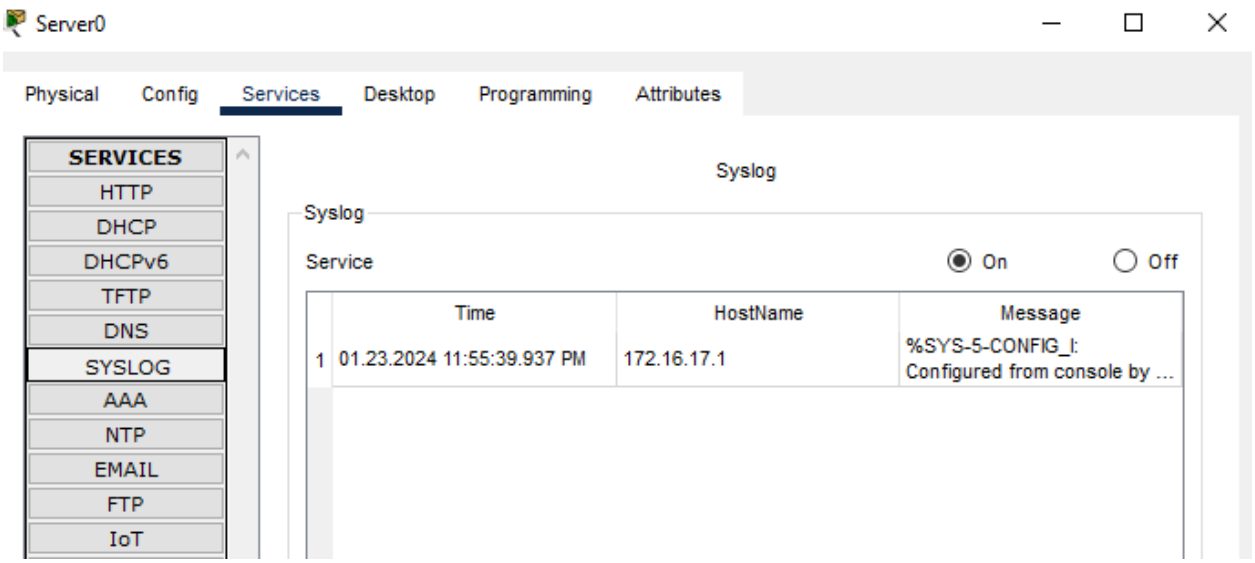

Рисунок 41 - проверка syslog

Отчет о выполненной роботе по настройке топологии сети с использованием EIGRP.