

Администрирование локальных сетей

Предварительная настройка оборудования Cisco (Лабораторная работа №2)

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Цель работы

Основная цель

- Получить навыки начальной настройки сетевого оборудования Cisco
- Изучить способы подключения к маршрутизатору и коммутатору
- Освоить настройку удалённого доступа (Telnet/SSH)
- Проверить работоспособность сети

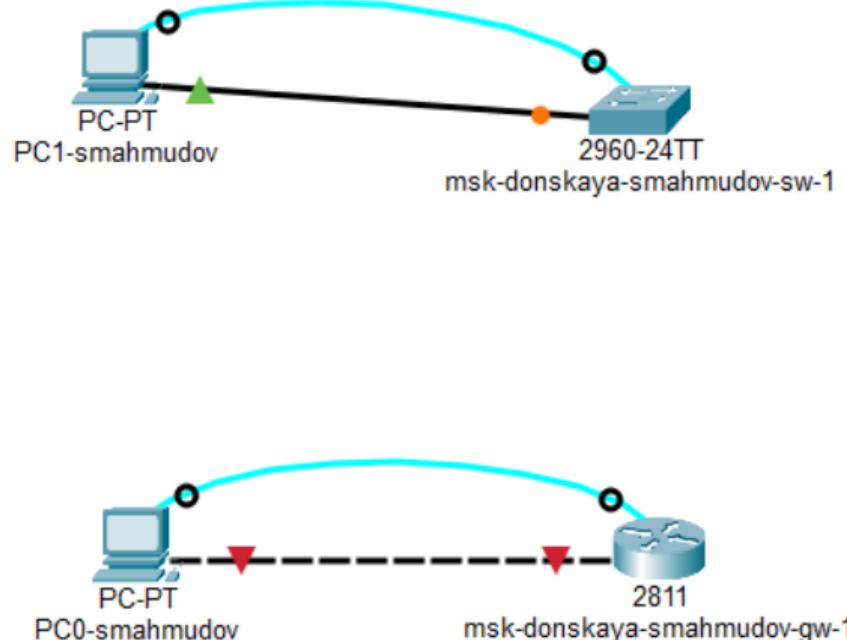
Теоретическая часть

Способы подключения

- Консольный кабель — первичная настройка
- Telnet — удалённый доступ без шифрования
- SSH — защищённый удалённый доступ
- AUX — подключение через модем

Выполнение лабораторной работы

Топология сети



Настройка IP на ПК

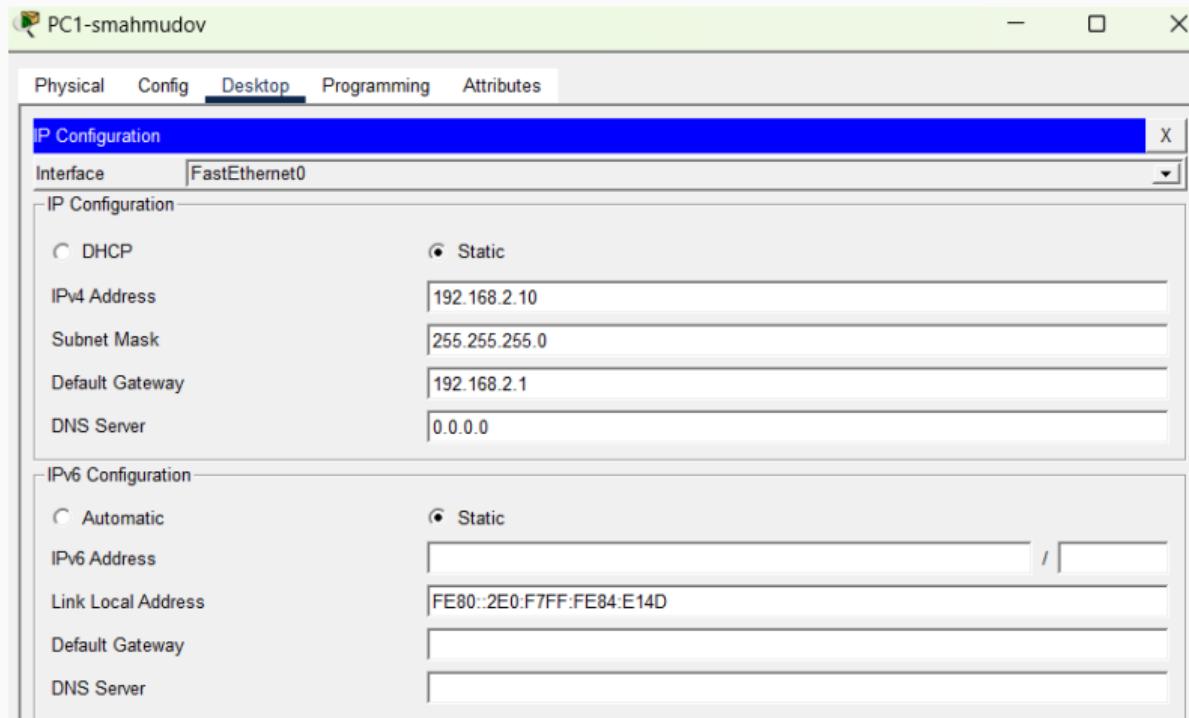


Рис. 2: Настройка PC1

Настройка IP на ПК

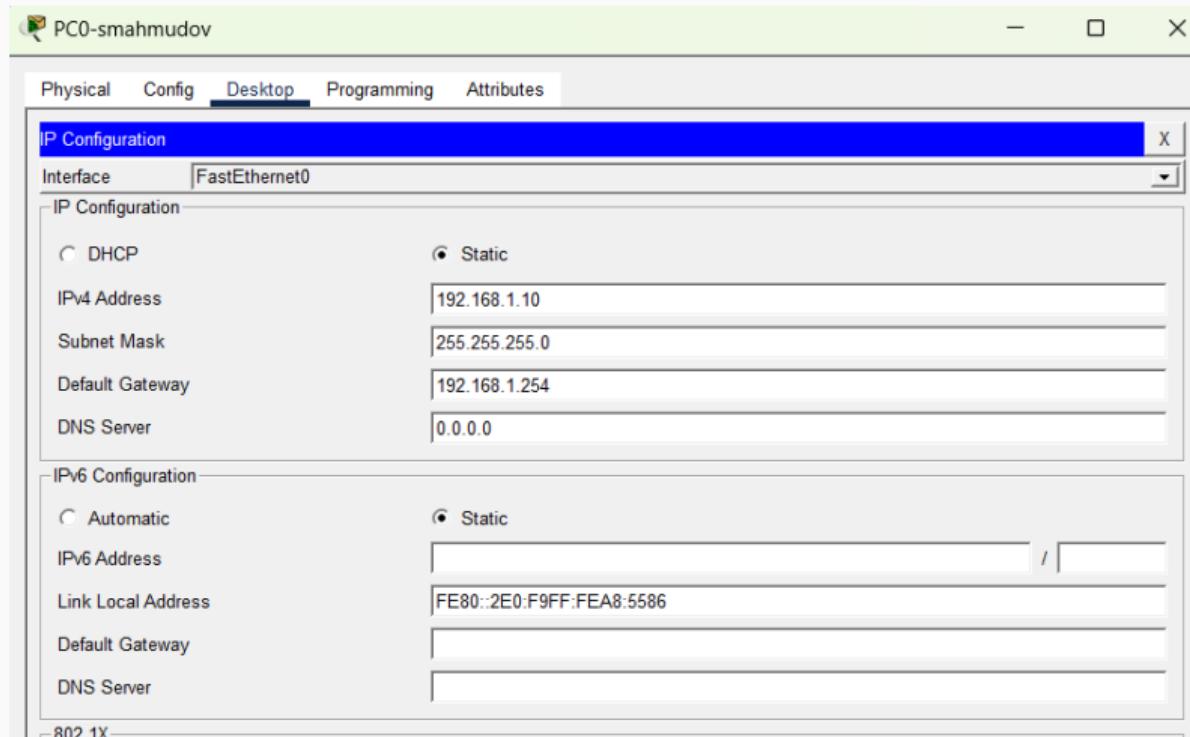


Рис. 3: Настройка PC0

Настройка маршрутизатора

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname msk-donskaya-smahmudov-gw-1
msk-donskaya-smahmudov-gw-1(config)#interface f0/0
msk-donskaya-smahmudov-gw-1(config-if)#no shutdown

msk-donskaya-smahmudov-gw-1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

msk-donskaya-smahmudov-gw-1(config-if)#ip address 192.168.1.254 255.255.255.0
msk-donskaya-smahmudov-gw-1(config-if)#line vty 0 4
msk-donskaya-smahmudov-gw-1(config-line)#password cisco
msk-donskaya-smahmudov-gw-1(config-line)#login
msk-donskaya-smahmudov-gw-1(config-line)#line console 0
msk-donskaya-smahmudov-gw-1(config-line)#password cisco
msk-donskaya-smahmudov-gw-1(config-line)#login
msk-donskaya-smahmudov-gw-1(config-line)#enable secret cisco
msk-donskaya-smahmudov-gw-1(config)#service password-encryption
msk-donskaya-smahmudov-gw-1(config)#username admin privilege 1 secret cisco
msk-donskaya-smahmudov-gw-1(config)#ip domain-name donskaya.rudn.edu
msk-donskaya-smahmudov-gw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-smahmudov-gw-1.donskaya.rudn.edu
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.

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

msk-donskaya-smahmudov-gw-1(config)#line vty 0 4
*Mar 1 0:6:19.511: RSA key size needs to be at least 768 bits for ssh version 2
*Mar 1 0:6:19.511: %SSH-5-ENABLED: SSH 1.5 has been enabled
msk-donskaya-smahmudov-gw-1(config-line)#transport input ssh
msk-donskaya-smahmudov-gw-1(config-line)#exit
msk-donskaya-smahmudov-gw-1(config)#exit
msk-donskaya-smahmudov-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-smahmudov-gw-1#write memory
Building configuration...
[OK]
msk-donskaya-smahmudov-gw-1#
```

Настройка коммутатора

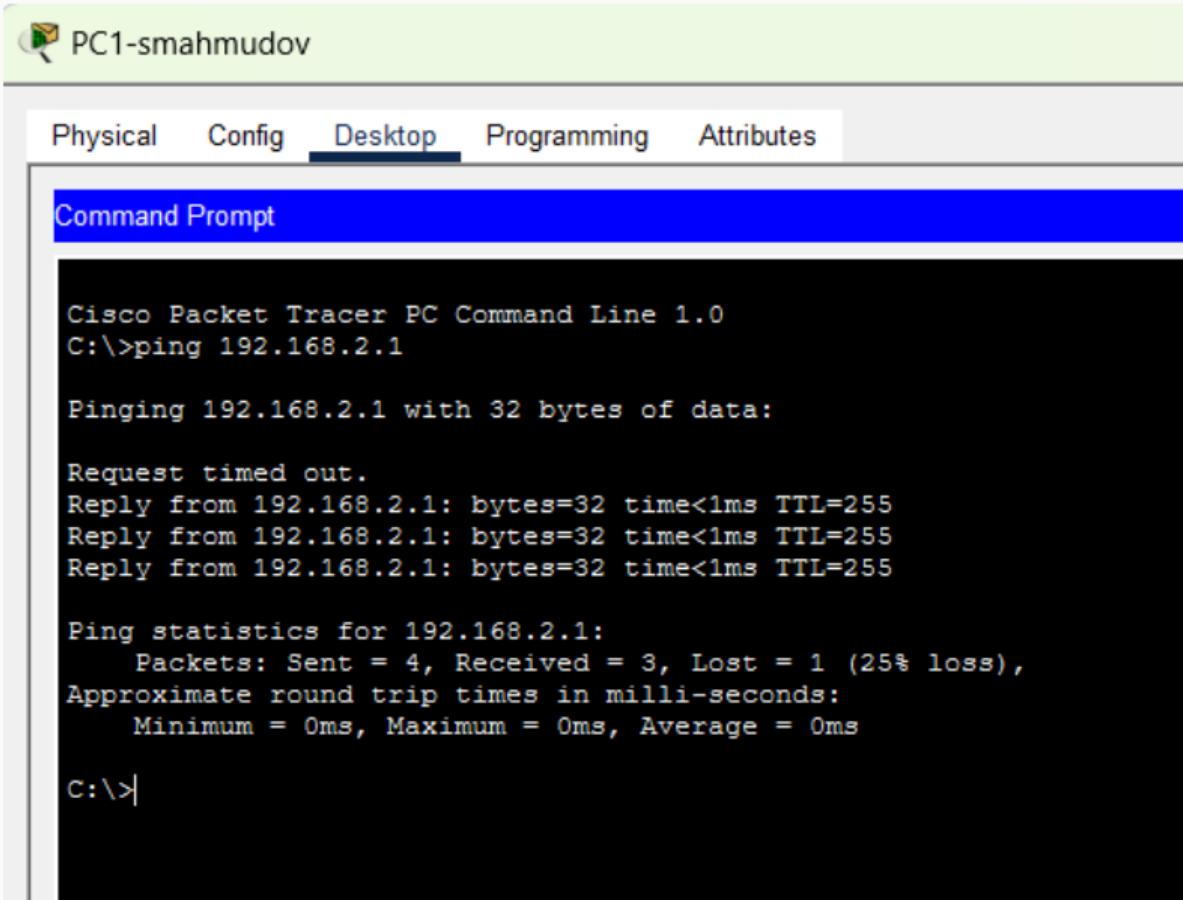
```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname msk-donskaya-smahmudov-sw-1
msk-donskaya-smahmudov-sw-1(config)#interface vlan2
msk-donskaya-smahmudov-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

msk-donskaya-smahmudov-sw-1(config-if)#no shutdown
msk-donskaya-smahmudov-sw-1(config-if)#ip address 192.168.2.1 255.255.255.0
msk-donskaya-smahmudov-sw-1(config-if)#interface f0/1
msk-donskaya-smahmudov-sw-1(config-if)#switchport mode access
msk-donskaya-smahmudov-sw-1(config-if)#switchport access vlan 2
msk-donskaya-smahmudov-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

msk-donskaya-smahmudov-sw-1(config-if)#ip default-gateway 192.168.2.254
msk-donskaya-smahmudov-sw-1(config)#line vty 0 4
msk-donskaya-smahmudov-sw-1(config-line)#password cisco
msk-donskaya-smahmudov-sw-1(config-line)#login
msk-donskaya-smahmudov-sw-1(config-line)#line console 0
msk-donskaya-smahmudov-sw-1(config-line)#password cisco
msk-donskaya-smahmudov-sw-1(config-line)#login
msk-donskaya-smahmudov-sw-1(config-line)#enable secret cisco
msk-donskaya-smahmudov-sw-1(config)#service password-encryption
msk-donskaya-smahmudov-sw-1(config)#username admin privilege 1 secret cisco
msk-donskaya-smahmudov-sw-1(config)#ip domain-name donskaya.rudn.edu
msk-donskaya-smahmudov-sw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-smahmudov-sw-1.donskaya.rudn.edu
Choose the size of the key modulus in the range of 360 to 4096 for your
    General Purpose Keys. Choosing a key modulus greater than 512 may take
    a few minutes.

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

msk-donskaya-smahmudov-sw-1(config)#line vty 0 4
*Mar 1 0:11:2.898: RSA key size needs to be at least 768 bits for ssh version 2
*Mar 1 0:11:2.898: %SSH-5-ENABLED: SSH 1.5 has been enabled
msk-donskaya-smahmudov-sw-1(config-line)#transport input ssh
msk-donskaya-smahmudov-sw-1(config-line)#[
```



The image shows a screenshot of the Cisco Packet Tracer software interface. At the top, there's a menu bar with tabs: Physical, Config, Desktop (which is selected), Programming, and Attributes. Below the menu is a blue header bar labeled "Command Prompt". The main area is a black terminal window displaying the output of a ping command. The text in the terminal is as follows:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.1

Pinging 192.168.2.1 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255
Reply from 192.168.2.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.2.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

The screenshot shows the Cisco Packet Tracer software interface. The title bar says "PC0-smahmudov". Below it is a menu bar with tabs: Physical, Config, Desktop (which is selected), Programming, and Attributes. The main area is titled "Command Prompt". Inside the Command Prompt window, the following text is displayed:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>
C:\>ping 192.168.1.254

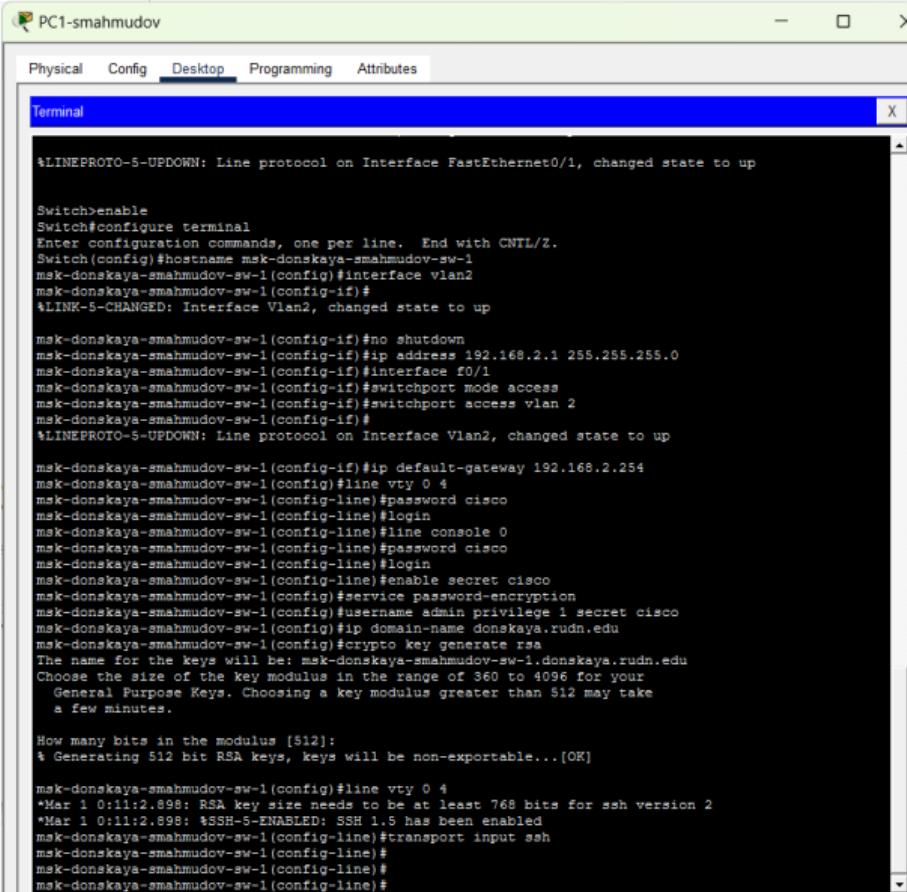
Pinging 192.168.1.254 with 32 bytes of data:

Reply from 192.168.1.254: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Подключение через консоль



Удалённый доступ к коммутатору

```
C:\>
C:\>telnet
Cisco Packet Tracer PC Telnet

Usage: telnet target [port]

C:\>telnet 192.168.2.1
Trying 192.168.2.1 ...Open

[Connection to 192.168.2.1 closed by foreign host]
C:\>ssh
Cisco Packet Tracer PC SSH

Usage: SSH -l username target

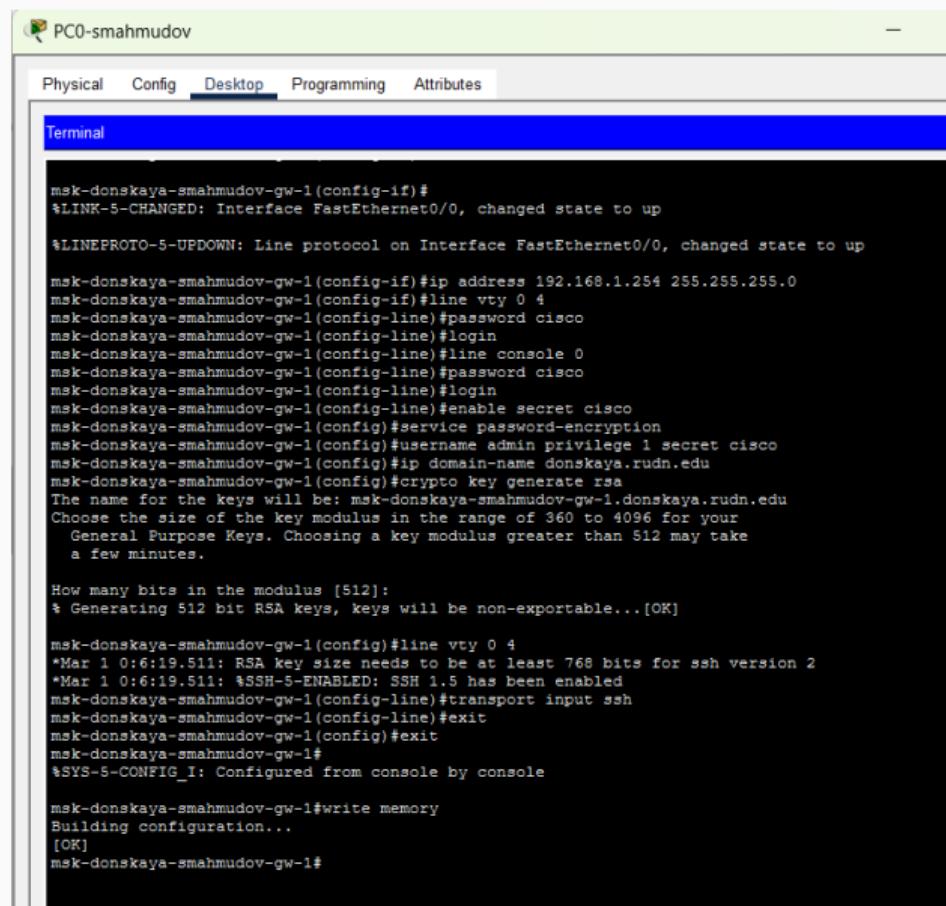
C:\>ssh -l admin 192.168.2.1

Password:

msk-donskaya-smahmudov-sw-1>enable
Password:
msk-donskaya-smahmudov-sw-1#exit

[Connection to 192.168.2.1 closed by foreign host]
C:\>
```

Удалённый доступ к маршрутизатору



The screenshot shows a terminal window titled "PC0-smahmudov" with several tabs: Physical, Config, Desktop, Programming, and Attributes. The "Config" tab is selected. The terminal window has a blue header bar with the title "Terminal". The main area of the terminal displays the following configuration session:

```
msk-donskaya-smahmudov-gw-1(config-if)#  
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up  
  
msk-donskaya-smahmudov-gw-1(config-if)#ip address 192.168.1.254 255.255.255.0  
msk-donskaya-smahmudov-gw-1(config-if)#line vty 0 4  
msk-donskaya-smahmudov-gw-1(config-line)#password cisco  
msk-donskaya-smahmudov-gw-1(config-line)#login  
msk-donskaya-smahmudov-gw-1(config-line)#line console 0  
msk-donskaya-smahmudov-gw-1(config-line)#password cisco  
msk-donskaya-smahmudov-gw-1(config-line)#login  
msk-donskaya-smahmudov-gw-1(config-line)#enable secret cisco  
msk-donskaya-smahmudov-gw-1(config)#service password-encryption  
msk-donskaya-smahmudov-gw-1(config)#username admin privilege 1 secret cisco  
msk-donskaya-smahmudov-gw-1(config)#ip domain-name donskaya.rudn.edu  
msk-donskaya-smahmudov-gw-1(config)#crypto key generate rsa  
The name for the keys will be: msk-donskaya-smahmudov-gw-1.donskaya.rudn.edu  
Choose the size of the key modulus in the range of 360 to 4096 for your  
General Purpose Keys. Choosing a key modulus greater than 512 may take  
a few minutes.  
  
How many bits in the modulus [512]:  
% Generating 512 bit RSA keys, keys will be non-exportable...[OK]  
  
msk-donskaya-smahmudov-gw-1(config)#line vty 0 4  
*Mar 1 0:6:19.511: RSA key size needs to be at least 768 bits for ssh version 2  
*Mar 1 0:6:19.511: %SSH-5-ENABLED: SSH 1.5 has been enabled  
msk-donskaya-smahmudov-gw-1(config-line)#transport input ssh  
msk-donskaya-smahmudov-gw-1(config-line)#exit  
msk-donskaya-smahmudov-gw-1(config)#exit  
msk-donskaya-smahmudov-gw-1#  
%SYS-5-CONFIG_I: Configured from console by console  
  
msk-donskaya-smahmudov-gw-1#write memory  
Building configuration...  
[OK]  
msk-donskaya-smahmudov-gw-1#
```

Удалённый доступ к маршрутизатору

```
C:\>
C:\>telnet 192.168.1.254
Trying 192.168.1.254 ...Open

[Connection to 192.168.1.254 closed by foreign host]
C:\>ssh -l admin 192.168.1.254

Password:

msk-donskaya-smahmudov-gw-1>enable
Password:
msk-donskaya-smahmudov-gw-1#exit

[Connection to 192.168.1.254 closed by foreign host]
C:\>
```

Рис. 11: SSH к маршрутизатору

Вывод

Итоги работы

- Собрана сеть
- Выполнена базовая конфигурация устройств
- Проверена связность с помощью ping
- Освоены способы подключения:
 - консоль
 - Telnet
 - SSH