

Администрирование локальных сетей

Предварительная настройка оборудования Cisco (Лабораторная работа №2)

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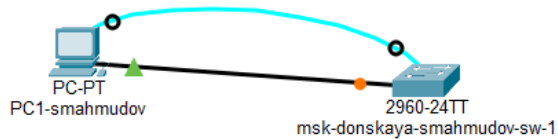
Цель работы

- 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

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

Выполнение лабораторной работы



Настройка IP на ПК

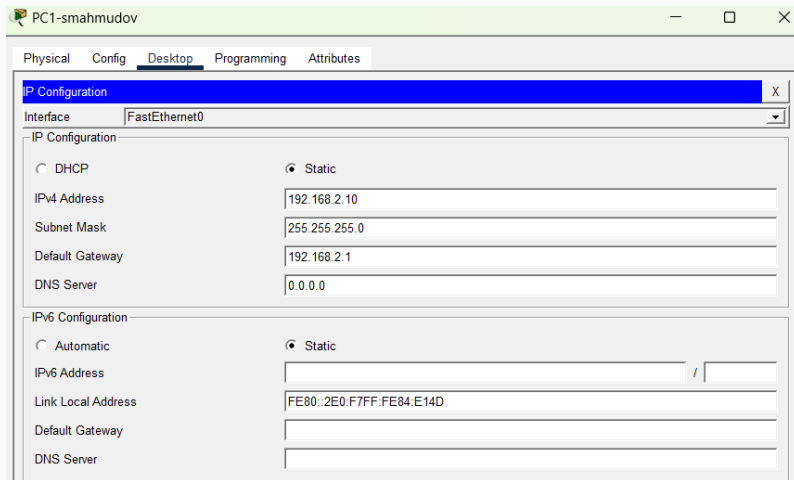


Рис. 2: Настройка PC1

Настройка IP на ПК

The screenshot shows a configuration window for a PC named 'PC0-smahmudov'. The 'Desktop' tab is selected, and the 'IP Configuration' section is highlighted. The interface is set to 'FastEthernet0'. Under 'IP Configuration', the 'Static' radio button is selected. The fields are filled with the following values:

Field	Value
IPv4 Address	192.168.1.10
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
DNS Server	0.0.0.0

Below the IPv4 section, the 'IPv6 Configuration' section is visible, with the 'Static' radio button selected. The fields are currently empty or partially filled:

Field	Value
IPv6 Address	
Link Local Address	FE80::2E0:F9FF:FEA8:5586
Default Gateway	
DNS Server	

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 donskeya.rudn.edu
msk-donskaya-smahmudov-gw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-smahmudov-gw-1.donskeya.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 donskeya.rudn.edu
msk-donskaya-smahmudov-sw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-smahmudov-sw-1.donskeya.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)#
```



PC1-smahmudov

Physical

Config

Desktop

Programming

Attributes

Command Prompt

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:\>|

 PC0-smahmudov

Physical Config Desktop Programming Attributes

Command Prompt

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

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

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

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

Ping statistics for 192.168.1.254:

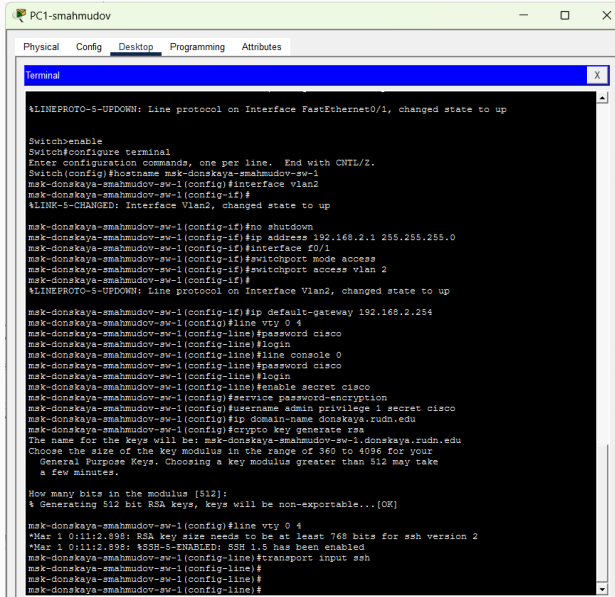
 Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

 Approximate round trip times in milli-seconds:

 Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>

Подключение через консоль



The screenshot shows a terminal window titled "PC1-smahmudov" with tabs for Physical, Config, Desktop, Programming, and Attributes. The Desktop tab is active, displaying a terminal window titled "Terminal". The terminal output shows the following commands and their results:

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

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 donskeya.rudn.edu
msk-donskaya-smahmudov-sw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-smahmudov-sw-1.donskeya.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)#
msk-donskaya-smahmudov-sw-1(config-line)#
msk-donskaya-smahmudov-sw-1(config-line)#
```

```
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

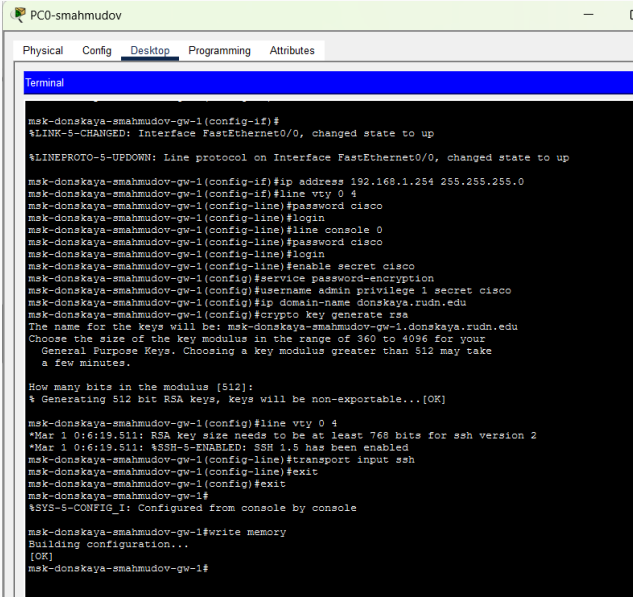
C:\>ssh -l admin 192.168.2.1

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



```
PC0-smahmudov
Physical Config Desktop Programming Attributes
Terminal
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 donskeya.rudn.edu
msk-donskaya-smahmudov-gw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-smahmudov-gw-1.donskeya.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#
```



```
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

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