Лабораторная работа №16

Администрирование локальных сетей

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Цель работы

Получение навыков настройки VPN-туннеля через незащищённое Интернетсоединение.

Выполнение лабораторной работы

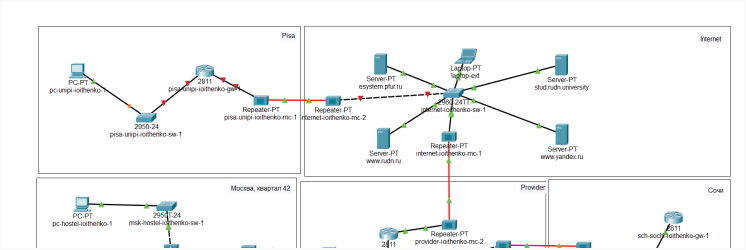

Рис. 1: Размещение оборудования

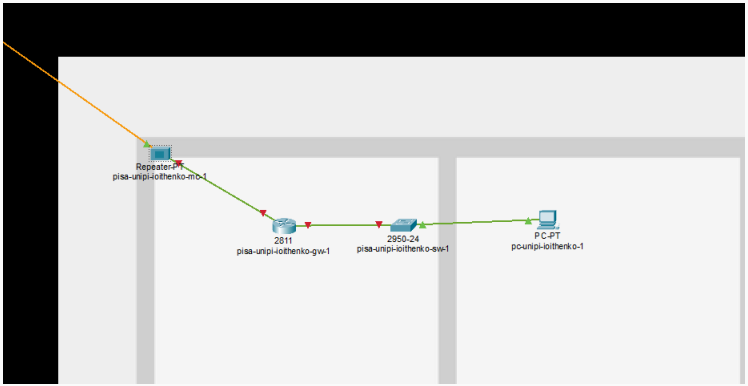

Рис. 2: Физическая область

```
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname pisa-unipi-ioithenko-gw-1
pisa-unipi-ioithenko-gw-1(config)#^Z
pisa-unipi-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

pisa-unipi-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
pisa-unipi-ioithenko-gw-1(config)#line vty 0 4
pisa-unipi-ioithenko-gw-1(config-line)#password cisco
pisa-unipi-ioithenko-gw-1(config-line)#login
pisa-unipi-ioithenko-gw-1(config-line)#exit
pisa-unipi-ioithenko-gw-1(config)#line console 0
pisa-unipi-ioithenko-gw-1(config-line)#password cisco
pisa-unipi-ioithenko-gw-1(config-line)#login
pisa-unipi-ioithenko-gw-1(config-line)#exit
pisa-unipi-ioithenko-gw-1(config)#enable secret cisco
pisa-unipi-ioithenko-gw-1(config)#service password-encryption
pisa-unipi-ioithenko-gw-1(config)#username admin privilege 1 secret cisco
pisa-unipi-ioithenko-gw-1(config)#ip domain-name unipi.edu
pisa-unipi-ioithenko-gw-1(config)#crypto key generate rsa
The name for the keys will be: pisa-unipi-ioithenko-gw-1.unipi.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]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

pisa-unipi-ioithenko-gw-1(config)#line vty 0 4
*Mar 1 0:10:38.654: %SSH-5-ENABLED: SSH 1.99 has been enabled
pisa-unipi-ioithenko-gw-1(config-line)#transport input ssh
pisa-unipi-ioithenko-gw-1(config-line)#^Z
pisa-unipi-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

pisa-unipi-ioithenko-gw-1#
```

Рис. 3: Первоначальная настройка

```
Switch(config)#hostname pisa-unipi-ioithenko-sw-1
pisa-unipi-ioithenko-sw-1(config)#^Z
pisa-unipi-ioithenko-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

pisa-unipi-ioithenko-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
pisa-unipi-ioithenko-sw-1(config)#line vty 0 4
pisa-unipi-ioithenko-sw-1(config-line)#password cisco
pisa-unipi-ioithenko-sw-1(config-line)#login
pisa-unipi-ioithenko-sw-1(config-line)#exit
pisa-unipi-ioithenko-sw-1(config)#line console 0
pisa-unipi-ioithenko-sw-1(config-line)#password cisco
pisa-unipi-ioithenko-sw-1(config-line)#login
pisa-unipi-ioithenko-sw-1(config-line)#exit
pisa-unipi-ioithenko-sw-1(config)#enable secret cisco
pisa-unipi-ioithenko-sw-1(config)#service passsword-encryption
                                                 ^
% Invalid input detected at '^' marker.

pisa-unipi-ioithenko-sw-1(config)#service password-encryption
pisa-unipi-ioithenko-sw-1(config)#username admin privilege 1 secret cisco
pisa-unipi-ioithenko-sw-1(config)#ip domain-name unipi.edu
pisa-unipi-ioithenko-sw-1(config)#crypto key generate rsa
The name for the keys will be: pisa-unipi-ioithenko-sw-1.unipi.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]: 2048
% Generating 2048 bit RSA keys, keys will be non-exportable...[OK]

pisa-unipi-ioithenko-sw-1(config)#line vty 0 4
*Mar 1 0:12:35.20: %SSH-5-ENABLED: SSH 1.99 has been enabled
pisa-unipi-ioithenko-sw-1(config-line)#transport input ssh
```

Рис. 4: Первоначальная настройка

```
pisa-unipi-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
pisa-unipi-ioithenko-gw-1(config)#int f0/0
pisa-unipi-ioithenko-gw-1(config-if)#no shutdown

pisa-unipi-ioithenko-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

pisa-unipi-ioithenko-gw-1(config-if)#exit
pisa-unipi-ioithenko-gw-1(config)#int f0/0.401
pisa-unipi-ioithenko-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.401, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.401, changed state to up

pisa-unipi-ioithenko-gw-1(config-subif)#encapsulation dot1Q 401
pisa-unipi-ioithenko-gw-1(config-subif)#ip address 10.131.0.1 255.255.255.0
pisa-unipi-ioithenko-gw-1(config-subif)#description unipi-main
pisa-unipi-ioithenko-gw-1(config-subif)#exit
pisa-unipi-ioithenko-gw-1(config)#int f0/1
pisa-unipi-ioithenko-gw-1(config-if)#no shutdown

pisa-unipi-ioithenko-gw-1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

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

pisa-unipi-ioithenko-gw-1(config-if)#ip address 192.0.2.20 255.255.255.0
pisa-unipi-ioithenko-gw-1(config-if)#description internet
pisa-unipi-ioithenko-gw-1(config-if)#exit
pisa-unipi-ioithenko-gw-1(config)#ip route 0.0.0.0 0.0.0.0 192.0.2.1
pisa-unipi-ioithenko-gw-1(config)#^Z
pisa-unipi-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
```

Рис. 5: Настройка интерфейсов

```
pisa-unipi-ioithenko-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
pisa-unipi-ioithenko-sw-1(config)#int f0/24
pisa-unipi-ioithenko-sw-1(config-if)#switchport mode trunk
pisa-unipi-ioithenko-sw-1(config-if)#exit
pisa-unipi-ioithenko-sw-1(config)#int f0/1
pisa-unipi-ioithenko-sw-1(config-if)#switchport mode access
pisa-unipi-ioithenko-sw-1(config-if)#switchport access vlan 401
% Access VLAN does not exist. Creating vlan 401
pisa-unipi-ioithenko-sw-1(config-if)#exit
pisa-unipi-ioithenko-sw-1(config)#vlan 401
pisa-unipi-ioithenko-sw-1(config-vlan)#name unipi-main
pisa-unipi-ioithenko-sw-1(config-vlan)#exit
pisa-unipi-ioithenko-sw-1(config)#int vlan401
pisa-unipi-ioithenko-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan401, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan401, changed state to up

pisa-unipi-ioithenko-sw-1(config-if)#no shutdown
pisa-unipi-ioithenko-sw-1(config-if)#exit
pisa-unipi-ioithenko-sw-1(config)#^Z
pisa-unipi-ioithenko-sw-1#
%SYS-5-CONFIG_I: Configured from console by console
```

Рис. 6: Настройка интерфейсов

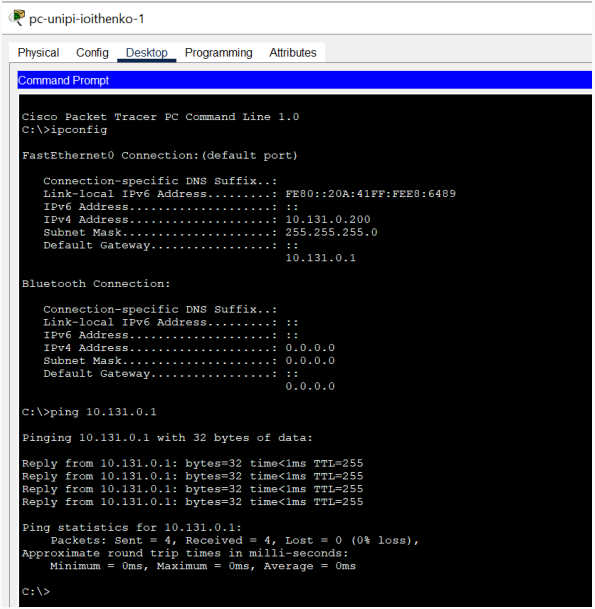

Рис. 7: Проверка

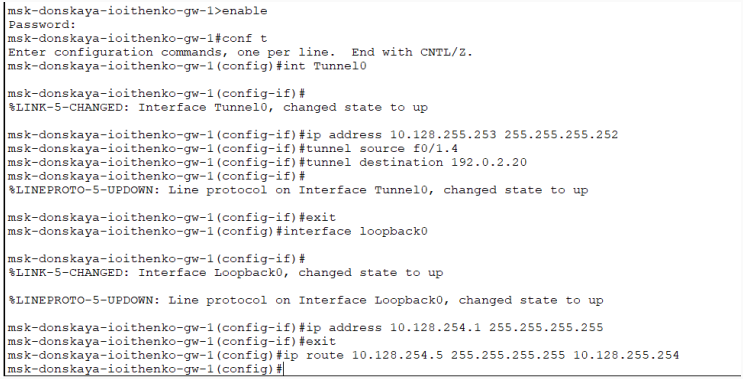

Рис. 8: Настройка VPN

```
pisa-unipi-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
pisa-unipi-ioithenko-gw-1(config)#interface Tunnel0

pisa-unipi-ioithenko-gw-1(config-if)#
%LINK-5-CHANGED: Interface Tunnel0, changed state to up

pisa-unipi-ioithenko-gw-1(config-if)#ip address 10.128.255.254 255.255.255.252
pisa-unipi-ioithenko-gw-1(config-if)#tunnel source f0/1
pisa-unipi-ioithenko-gw-1(config-if)#tunnel destination 198.51.100.2
pisa-unipi-ioithenko-gw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel0, changed state to up

pisa-unipi-ioithenko-gw-1(config-if)#exit
pisa-unipi-ioithenko-gw-1(config)#interface loopback0

pisa-unipi-ioithenko-gw-1(config-if)#
%LINK-5-CHANGED: Interface Loopback0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, changed state to up

pisa-unipi-ioithenko-gw-1(config-if)#ip address 10.128.254.5 255.255.255.255
pisa-unipi-ioithenko-gw-1(config-if)#exit
pisa-unipi-ioithenko-gw-1(config)#ip route 10.128.254.1 255.255.255.255 10.128.255.253
pisa-unipi-ioithenko-gw-1(config)#router ospf 1
pisa-unipi-ioithenko-gw-1(config-router)#router-id 10.128.254.5
pisa-unipi-ioithenko-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
pisa-unipi-ioithenko-gw-1(config-router)#exit
pisa-unipi-ioithenko-gw-1(config)#^Z
pisa-unipi-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

pisa-unipi-ioithenko-gw-1#
```

Рис. 9: Настройка VPN

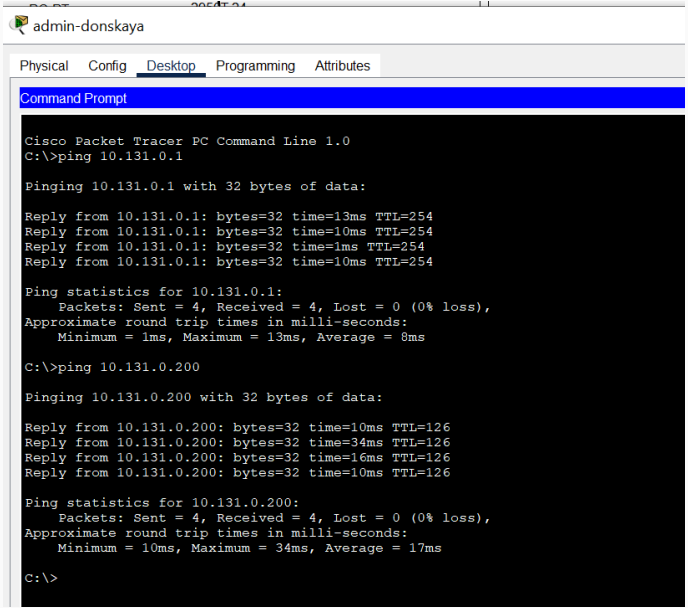

Рис. 10: Настройка VPN

Выводы

В ходе выполнения лабораторной работы я получила навыков настройки VPN-туннеля через незащищённое Интернетсоединение.