

Презентация по лабораторной работе №16

Дисциплина: Администрирование локальных сетей

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Информация

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Цель

Получение навыков настройки VPN-туннеля через незащищённое Интернет-соединение.

Задание

Настроить VPN-туннель между сетью Университета г. Пиза (Италия) и сетью «Донская» в г. Москва. При выполнении работы необходимо учитывать соглашение об именовании.

Выполнение

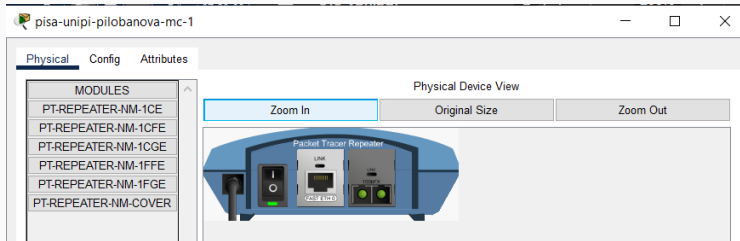


Рис. 1: Медиаконвертер с модулями PT-REPEATER-NM-1FFE и PT-REPEATER-NM-1CFE

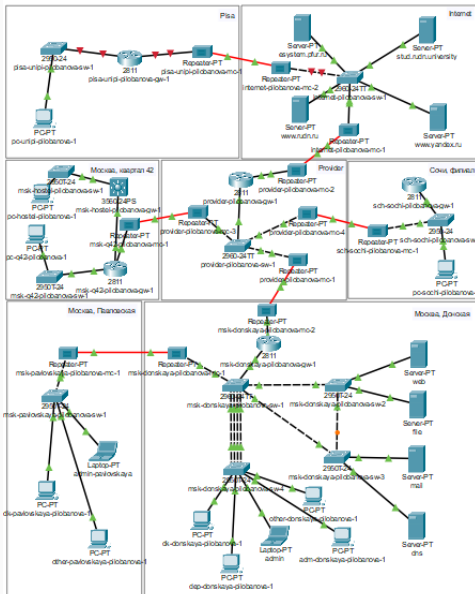


Рис. 2: Схема сети с дополнительными площадками

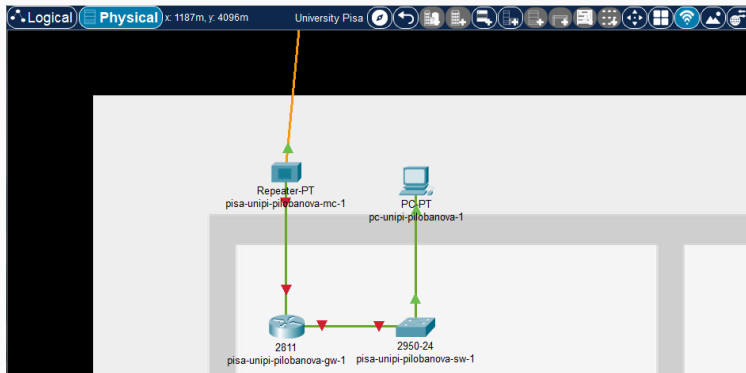


Рис. 3: Здание в г. Пиза

```

Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#line vty 0 4
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#line console 0
      ^
% Invalid input detected at '^' marker.

Router(config)#line console 0
Router(config-line)#password cisco
Router(config-line)#login
Router(config-line)#exit
Router(config)#enable secret cisco
Router(config)#service password-encryption
Router(config)#username admin privilege 1 secret cisco
Router(config)#ip domain-name unipi.edu
Router(config)#crypto key generate rsa
% Please define a hostname other than Router.
Router(config)#hostname pisa-unipi-pilobanova-gw-1
pisa-unipi-pilobanova-gw-1(config)#crypto key generate rsa
The name for the keys will be: pisa-unipi-pilobanova-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-pilobanova-gw-1(config)#line vty 0 4
*Mar 1 0:13:16.280: %SSH-5-ENABLED: SSH 1.99 has been enabled
pisa-unipi-pilobanova-gw-1(config-line)#transport input ssh
pisa-unipi-pilobanova-gw-1(config-line)#^Z
pisa-unipi-pilobanova-gw-1#

```

Рис. 4: Первоначальная настройка маршрутизатора *pisa-unipi-gw-1*

```

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname pisa-unipi-pilobanova-sw-1
pisa-unipi-pilobanova-sw-1(config)#line vty 0 4
pisa-unipi-pilobanova-sw-1(config-line)#password cisco
pisa-unipi-pilobanova-sw-1(config-line)#login
pisa-unipi-pilobanova-sw-1(config-line)#exit
pisa-unipi-pilobanova-sw-1(config)#line console 0
pisa-unipi-pilobanova-sw-1(config-line)#password cisco
pisa-unipi-pilobanova-sw-1(config-line)#login
pisa-unipi-pilobanova-sw-1(config-line)#exit
pisa-unipi-pilobanova-sw-1(config)#enable secret cisco
pisa-unipi-pilobanova-sw-1(config)#service password-encryption
pisa-unipi-pilobanova-sw-1(config)#username admin privilege 1 secret cisco
pisa-unipi-pilobanova-sw-1(config)#ip domain-name unipi.edu
pisa-unipi-pilobanova-sw-1(config)#crypto key generate rsa
The name for the keys will be: pisa-unipi-pilobanova-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-pilobanova-sw-1(config)#line vty 0 4
*Mar 1 0:16:4.970: %SSH-5-ENABLED: SSH 1.99 has been enabled
pisa-unipi-pilobanova-sw-1(config-line)#transport input ssh
pisa-unipi-pilobanova-sw-1(config-line)#^Z
pisa-unipi-pilobanova-sw-1#

```

Рис. 5: Первоначальная настройка коммутатора *pisa-unipi-sw-1*

```

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

pisa-unipi-pilobanova-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-pilobanova-gw-1(config-if)#exit
pisa-unipi-pilobanova-gw-1(config)#int f0/0.401
pisa-unipi-pilobanova-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-pilobanova-gw-1(config-subif)#encapsulation dotq1 401
                                     ^
% Invalid input detected at '^' marker.

pisa-unipi-pilobanova-gw-1(config-subif)#encapsulation dotQ1 401
                                     ^
% Invalid input detected at '^' marker.

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

pisa-unipi-pilobanova-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-pilobanova-gw-1(config-if)#ip address 192.0.2.20 255.255.255.0
pisa-unipi-pilobanova-gw-1(config-if)#description internet
pisa-unipi-pilobanova-gw-1(config-if)#int f0/0.401
pisa-unipi-pilobanova-gw-1(config-subif)#description unipi-main
pisa-unipi-pilobanova-gw-1(config-subif)#exit
pisa-unipi-pilobanova-gw-1(config)#ip route 0.0.0.0 0.0.0.0 192.0.2.1
pisa-unipi-pilobanova-gw-1(config)#^Z
pisa-unipi-pilobanova-gw-1#

```

Рис. 6: Настройка интерфейсов маршрутизатора *pisa-unipi-gw-1*

```
pisa-unipi-pilobanova-sw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
pisa-unipi-pilobanova-sw-1(config)#int f0/24
pisa-unipi-pilobanova-sw-1(config-if)#switchport mode trunk
pisa-unipi-pilobanova-sw-1(config-if)#exit
pisa-unipi-pilobanova-sw-1(config)#int f0/1
pisa-unipi-pilobanova-sw-1(config-if)#switchport mode access
pisa-unipi-pilobanova-sw-1(config-if)#switchport access vlan 401
% Access VLAN does not exist. Creating vlan 401
pisa-unipi-pilobanova-sw-1(config-if)#exit
pisa-unipi-pilobanova-sw-1(config)#vlan 401
pisa-unipi-pilobanova-sw-1(config-vlan)#name unipi-main
pisa-unipi-pilobanova-sw-1(config-vlan)#exit
pisa-unipi-pilobanova-sw-1(config)#int vlan401
pisa-unipi-pilobanova-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-pilobanova-sw-1(config-if)#no shutdown
pisa-unipi-pilobanova-sw-1(config-if)#exit
pisa-unipi-pilobanova-sw-1(config)#^Z
pisa-unipi-pilobanova-sw-1#
```

Рис. 7: Настройка интерфейсов коммутатора pisa-unipi-sw-1

```
msk-donskaya-pilobanova-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-gw-1(config)#int Tunnel0

msk-donskaya-pilobanova-gw-1(config-if)#
%LINK-5-CHANGED: Interface Tunnel0, changed state to up

msk-donskaya-pilobanova-gw-1(config-if)#ip address 10.128.255.253 255.255.255.252
msk-donskaya-pilobanova-gw-1(config-if)#tunnel source f0/1.4
msk-donskaya-pilobanova-gw-1(config-if)#tunnel destination 192.0.2.20
msk-donskaya-pilobanova-gw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel0, changed state to up

msk-donskaya-pilobanova-gw-1(config-if)#exit
msk-donskaya-pilobanova-gw-1(config)#int loopback0

msk-donskaya-pilobanova-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

msk-donskaya-pilobanova-gw-1(config-if)#ip address 10.128.254.1 255.255.255.255
msk-donskaya-pilobanova-gw-1(config-if)#exit
msk-donskaya-pilobanova-gw-1(config)#ip route 10.128.254.5 255.255.255.255 10.128.255.254
msk-donskaya-pilobanova-gw-1(config)#^Z
msk-donskaya-pilobanova-gw-1#
```

Рис. 8: Настройка маршрутизатора *msk-donskaya-gw-1*


```

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

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

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

pisa-unipi-pilobanova-gw-1(config-if)#exit
pisa-unipi-pilobanova-gw-1(config)#int loopback0

pisa-unipi-pilobanova-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-pilobanova-gw-1(config-if)#ip address 10.128.254.5 255.255.255.255
pisa-unipi-pilobanova-gw-1(config-if)#exit
pisa-unipi-pilobanova-gw-1(config)#ip route 10.128.254.1 255.255.255.255 10.128.255.253
pisa-unipi-pilobanova-gw-1(config)#router ospf 1
pisa-unipi-pilobanova-gw-1(config-router)#router-id 10.128.254.5
pisa-unipi-pilobanova-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
pisa-unipi-pilobanova-gw-1(config-router)#exit
pisa-unipi-pilobanova-gw-1(config)#^Z
pisa-unipi-pilobanova-gw-1#

```

Рис. 9: Настройка маршрутизатора *pisa-unipi-gw-1*

Вывод

Я получила навыки настройки VPN-туннеля через незащищённое Интернет-соединение.