Презентация по лабораторной работе 16

Администрирование локальных сетей

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Информация

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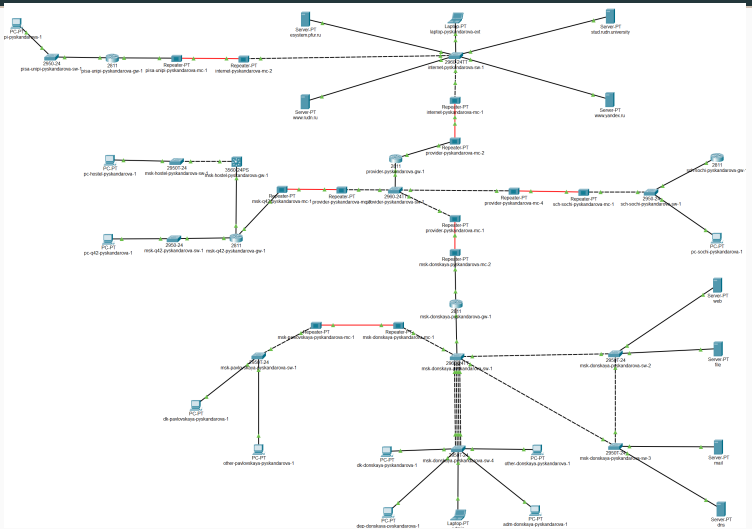
Вводная часть

Цели и задачи

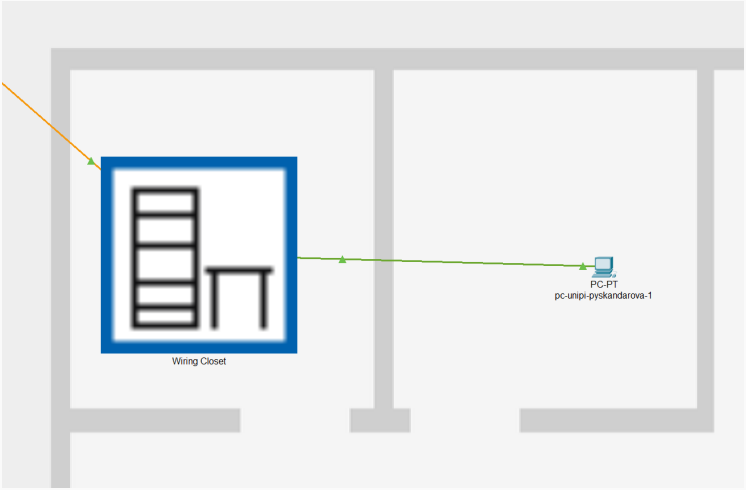
Получение навыков настройки VPN-туннеля через незащищённое Интернет-соединение.

Выполнение лабораторной работы

Разместить в рабочей области проекта в соответствии с модельными предположениями оборудование для сети Университета г. Пиза.



В физической рабочей области проекта создать город Пиза, здание Университета г. Пиза. Переместить туда соответствующее оборудование.



Сделать первоначальную настройку и настройку интерфейсов оборудования сети Университета г. Пиза. Первоначальная настройка маршрутизатора pisa-unipi-gw-1.

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname pisa-unipi-pyskandarova-gw-1
pisa-unipi-pyskandarova-gw-1(config)#line vty 0 4
pisa-unipi-pyskandarova-gw-1(config-line)#password cisco
pisa-unipi-pyskandarova-gw-1(config-line)#login
pisa-unipi-pyskandarova-gw-1(config-line)#exit
pisa-unipi-pyskandarova-gw-1(config)#line console 0
pisa-unipi-pyskandarova-gw-1(config-line)#password cisco
pisa-unipi-pyskandarova-gw-1(config-line)#login
pisa-unipi-pyskandarova-gw-1(config-line)#exit
pisa-unipi-pyskandarova-gw-1(config)#enable secret cisco
pisa-unipi-pyskandarova-gw-1(config)#service password-encryption
pisa-unipi-pyskandarova-gw-1(config)#usernname admin privilege 1 secret cisco
                                     ^
% Invalid input detected at '^' marker.

pisa-unipi-pyskandarova-gw-1(config)#username admin privilege 1 secret cisco
pisa-unipi-pyskandarova-gw-1(config)#ip domain-name unipi.edu
pisa-unipi-pyskandarova-gw-1(config)#crypto key generate rsa
The name for the keys will be: pisa-unipi-pyskandarova-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]:
% Generating 512 bit RSA keys, keys will be non-exportable...[OK]

pisa-unipi-pyskandarova-gw-1(config)#line vty 0 4
*Mar 1 0:3:53.515: RSA key size needs to be at least 768 bits for ssh version 2
*Mar 1 0:3:53.536: %SSH-5-ENABLED: SSH 1.5 has been enabled
pisa-unipi-pyskandarova-gw-1(config-line)#transport input ssh
```

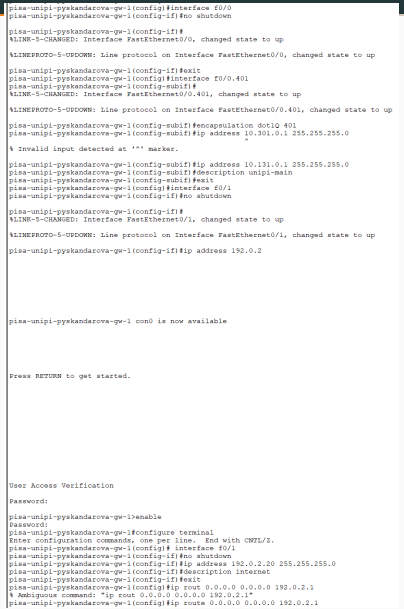
Первоначальная настройка коммутатора pisa-unipi-sw-1.

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname pisa-unipi-pyskandarova-sw-1
pisa-unipi-pyskandarova-sw-1(config)#line vty 0 4
pisa-unipi-pyskandarova-sw-1(config-line)#password cisco
pisa-unipi-pyskandarova-sw-1(config-line)#login
pisa-unipi-pyskandarova-sw-1(config-line)#exit
pisa-unipi-pyskandarova-sw-1(config)#line console 0
pisa-unipi-pyskandarova-sw-1(config-line)#password
% Incomplete command.
pisa-unipi-pyskandarova-sw-1(config-line)#password cisco
pisa-unipi-pyskandarova-sw-1(config-line)#login
pisa-unipi-pyskandarova-sw-1(config-line)#exit
pisa-unipi-pyskandarova-sw-1(config)#enable secret cisco
pisa-unipi-pyskandarova-sw-1(config)#service password-encryption
pisa-unipi-pyskandarova-sw-1(config)#username admin privilege 1 secret cisco
pisa-unipi-pyskandarova-sw-1(config)#ip  domain-name unipi.edu
pisa-unipi-pyskandarova-sw-1(config)#crypto key generate rsa
The name for the keys will be: pisa-unipi-pyskandarova-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]:
% Generating 512 bit RSA keys, keys will be non-exportable...[OK]

pisa-unipi-pyskandarova-sw-1(config)#line vty 0 4
*Mar 1 0:8:45.42: RSA key size needs to be at least 768 bits for ssh version 2
*Mar 1 0:8:45.42: %SSH-5-ENABLED: SSH 1.5 has been enabled
pisa-unipi-pyskandarova-sw-1(config-line)#transport input ssh
```

Настройка интерфейсов маршрутизатора pisa-unipi-gw-1.



Настройка интерфейсов коммутатора pisa-unipi-sw-1

```
Password:

pisa-unipi-pyskandarova-sw-1>enable
Password:
pisa-unipi-pyskandarova-sw-1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
pisa-unipi-pyskandarova-sw-1(config)#interface f0/24
pisa-unipi-pyskandarova-sw-1(config-if)#switchport mode trunk
pisa-unipi-pyskandarova-sw-1(config-if)#exit
pisa-unipi-pyskandarova-sw-1(config)#interface f0/1
pisa-unipi-pyskandarova-sw-1(config-if)#switchport mode access
pisa-unipi-pyskandarova-sw-1(config-if)#switchport access vlan 401
% Access VLAN does not exist. Creating vlan 401
pisa-unipi-pyskandarova-sw-1(config-if)#exit
pisa-unipi-pyskandarova-sw-1(config)#vlan 401
pisa-unipi-pyskandarova-sw-1(config-vlan)#name unipi-main
pisa-unipi-pyskandarova-sw-1(config-vlan)#exit
pisa-unipi-pyskandarova-sw-1(config)#interface vlan401
pisa-unipi-pyskandarova-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-pyskandarova-sw-1(config-if)#no shutdown
pisa-unipi-pyskandarova-sw-1(config-if)#exit
```

Настроить VPN на основе протокола GRE [25]. Настройка маршрутизатора msk-donskaya-gw-1.

```
Password:

msk-donskaya-pyskandarova-gw-1>enable
Password:
msk-donskaya-pyskandarova-gw-1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pyskandarova-gw-1(config)#interface Tunnel0

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

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

msk-donskaya-pyskandarova-gw-1(config-if)#exit
msk-donskaya-pyskandarova-gw-1(config)#interface loopback0

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

Настройка маршрутизатора pisa-unipi-gw-1.

```
pisa-unipi-pyskandarova-gw-1(config)#interface Tunnel0

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

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

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

pisa-unipi-pyskandarova-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-pyskandarova-gw-1(config-if)#ip address 10.128.254.5 255.255.255.255
pisa-unipi-pyskandarova-gw-1(config-if)#exit
pisa-unipi-pyskandarova-gw-1(config)#ip route 10.128.254.1 255.255.255.255
% Incomplete command.
pisa-unipi-pyskandarova-gw-1(config)#ip route 10.128.254.1 255.255.255.255 10.128.255.253
pisa-unipi-pyskandarova-gw-1(config)#router ospf 1
pisa-unipi-pyskandarova-gw-1(config-router)#router-id 10.128.254.5
pisa-unipi-pyskandarova-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
pisa-unipi-pyskandarova-gw-1(config-router)#exit
```

Результаты

Вывод

Получены навыки настройки VPN-туннеля через незащищённое Интернет-соединение.