

Лабораторная работа №6

Статическая маршрутизация VLAN

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Вводная часть

Цель работы

Настроить статическую маршрутизацию VLAN в сети.

Задание

1. Добавить в локальную сеть маршрутизатор, провести его первоначальную настройку.
2. Настроить статическую маршрутизацию VLAN.
3. При выполнении работы необходимо учитывать соглашение об именовании

Выполнение лабораторной работы

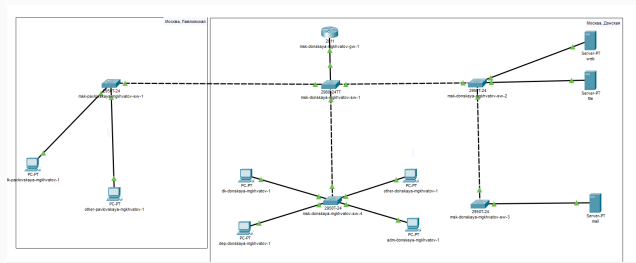


Рис. 1: Логическая область проекта с добавленным маршрутизатором

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

msk-donskaya-mgkhvatov-gw-1(config-if)#
%LINK-6-CHANGED: Interface FastEthernet0/0, changed state to up

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

msk-donskaya-mgkhvatov-gw-1(config-if)#-2
msk-donskaya-mgkhvatov-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-mgkhvatov-gw-1#wr m
Building configuration...
[OK]
msk-donskaya-mgkhvatov-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-mgkhvatov-gw-1(config)#line vty 0 4
msk-donskaya-mgkhvatov-gw-1(config-line)#password cisco
msk-donskaya-mgkhvatov-gw-1(config-line)#login
msk-donskaya-mgkhvatov-gw-1(config-line)#exit
msk-donskaya-mgkhvatov-gw-1(config)#enable secret cisco
msk-donskaya-mgkhvatov-gw-1(config)#service password-encryption
msk-donskaya-mgkhvatov-gw-1(config)#username admin privilege 1 secret cisco
msk-donskaya-mgkhvatov-gw-1(config)#ip domain-name donskeya.rudn.edu
msk-donskaya-mgkhvatov-gw-1(config)#crypto key generate rsa
The name for the keys will be: msk-donskaya-mgkhvatov-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-mgkhvatov-gw-1(config)#line vty 0 4
*Mar 1 0:4:10.365: RSA key size needs to be at least 768 bits for ssh version 2
*Mar 1 0:4:10.371: %SSH-5-ENABLED: SSH 1.5 has been enabled
msk-donskaya-mgkhvatov-gw-1(config-line)#transport input ssh
msk-donskaya-mgkhvatov-gw-1(config-line)#
```

Рис. 2: Конфигурация маршрутизатора

Выполнение лабораторной работы

```
msk-donskaya-mgkhvatov-gw-1(config-line)#transport input ssh
msk-donskaya-mgkhvatov-gw-1(config-line)#interface f0/0
msk-donskaya-mgkhvatov-gw-1(config-if)#no shutdown
msk-donskaya-mgkhvatov-gw-1(config-if)#interface f0/0.2
^
% Invalid input detected at '^' marker.

msk-donskaya-mgkhvatov-gw-1(config-if)#interface f0/0.2
msk-donskaya-mgkhvatov-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.2, changed state to up

msk-donskaya-mgkhvatov-gw-1(config-subif)#encapsulation dot1Q 2
msk-donskaya-mgkhvatov-gw-1(config-subif)#ip address 10.128.1.1 255.255.255.0
msk-donskaya-mgkhvatov-gw-1(config-subif)#description management
^
% Invalid input detected at '^' marker.

msk-donskaya-mgkhvatov-gw-1(config-subif)#description management
msk-donskaya-mgkhvatov-gw-1(config-subif)#exit
msk-donskaya-mgkhvatov-gw-1(config)#interface f0/0.3
msk-donskaya-mgkhvatov-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.3, changed state to up

msk-donskaya-mgkhvatov-gw-1(config-subif)#encapsulation dot1Q 3
msk-donskaya-mgkhvatov-gw-1(config-subif)#ip address 10.128.0.1 255.255.255.0
msk-donskaya-mgkhvatov-gw-1(config-subif)#description management
msk-donskaya-mgkhvatov-gw-1(config-subif)#description servers
msk-donskaya-mgkhvatov-gw-1(config-subif)#exit
msk-donskaya-mgkhvatov-gw-1(config)#interface f0/0.101
^
% Invalid input detected at '^' marker.

msk-donskaya-mgkhvatov-gw-1(config)#interface f0/0.101
msk-donskaya-mgkhvatov-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.101, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.101, changed state to up

msk-donskaya-mgkhvatov-gw-1(config-subif)#encapsulation dot1Q 101
msk-donskaya-mgkhvatov-gw-1(config-subif)#ip address 10.128.3.1 255.255.255.0
msk-donskaya-mgkhvatov-gw-1(config-subif)#description dk
```

```
msh-donskaya-mgkhvatov-gw-1(config)#interface f0/0.102
msh-donskaya-mgkhvatov-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.102, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.102, changed state to up

msh-donskaya-mgkhvatov-gw-1(config-subif)#encapsulation dot1Q 102
msh-donskaya-mgkhvatov-gw-1(config-subif)#ip address 10.128.4.1 255.255.255.0
msh-donskaya-mgkhvatov-gw-1(config-subif)#description departments
msh-donskaya-mgkhvatov-gw-1(config-subif)#exit
msh-donskaya-mgkhvatov-gw-1(config)#encapsulation dot1Q 103
msh-donskaya-mgkhvatov-gw-1(config)#
^
% Invalid input detected at '^' marker.

msh-donskaya-mgkhvatov-gw-1(config)#interface f0/0.103
msh-donskaya-mgkhvatov-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.103, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.103, changed state to up

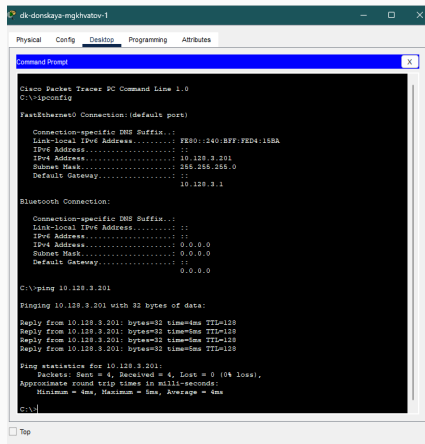
msh-donskaya-mgkhvatov-gw-1(config-subif)#encapsulation dot1Q 103
msh-donskaya-mgkhvatov-gw-1(config-subif)#ip address 10.128.5.1 255.255.255.0
msh-donskaya-mgkhvatov-gw-1(config-subif)#description adm
msh-donskaya-mgkhvatov-gw-1(config-subif)#interface f0/0.104
msh-donskaya-mgkhvatov-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.104, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.104, changed state to up

msh-donskaya-mgkhvatov-gw-1(config-subif)#encapsulation dot1Q 104
msh-donskaya-mgkhvatov-gw-1(config-subif)#ip address 10.128.6.1 255.255.255.0
msh-donskaya-mgkhvatov-gw-1(config-subif)#description other
```

Рис. 4: Конфигурация VLAN-интерфейсов маршрутизатора

Выполнение лабораторной работы



```
dk-donskaya-mgkhvatov-1
Physical Config Desktop Programming Attributes

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection: (default port)

Connection-specific DNS Suffix...:
Link-local IPv6 Address...: FE80::140:BFF:FE24:15BA
IPv6 Address...: ::
IPv4 Address...: 10.128.3.201
Subnet Mask...: 255.255.255.0
Default Gateway...: ::
10.128.3.1

Bluetooth Connection:

Connection-specific DNS Suffix...:
Link-local IPv6 Address...: ::
IPv6 Address...: ::
IPv4 Address...: 0.0.0.0
Subnet Mask...: 0.0.0.0
Default Gateway...: ::
0.0.0.0

C:\>ping 10.128.3.201

Pinging 10.128.3.201 with 32 bytes of data:

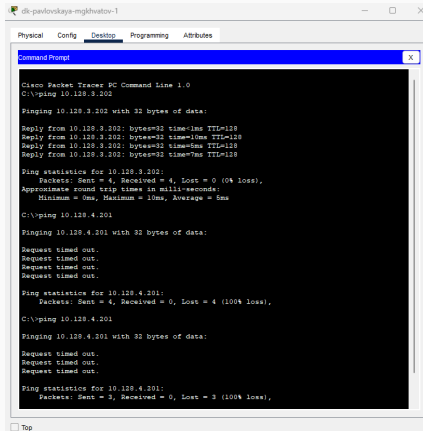
Reply from 10.128.3.201: bytes=32 time=4ms TTL=128
Reply from 10.128.3.201: bytes=32 time=5ms TTL=128
Reply from 10.128.3.201: bytes=32 time=4ms TTL=128
Reply from 10.128.3.201: bytes=32 time=5ms TTL=128

Ping statistics for 10.128.3.201:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 5ms, Average = 4ms

C:\>
```

Рис. 5: Проверка доступности оконечных устройств

Выполнение лабораторной работы



The screenshot shows a Cisco Packet Tracer PC Command Line window for a device named 'dlk-pavlovskaya-mgkhvatov-1'. The window has tabs for Physical, Config, Desktop, Programming, and Attributes. The Command Prompt shows the following output:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.128.3.202

Pinging 10.128.3.202 with 32 bytes of data:

Reply from 10.128.3.202: bytes=32 time<1ms TTL=128
Reply from 10.128.3.202: bytes=32 time=10ms TTL=128
Reply from 10.128.3.202: bytes=32 time=5ms TTL=128
Reply from 10.128.3.202: bytes=32 time=7ms TTL=128

Ping statistics for 10.128.3.202:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 5ms

C:\>ping 10.128.4.201

Pinging 10.128.4.201 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.128.4.201:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 10.128.4.201

Pinging 10.128.4.201 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.128.4.201:
    Packets: Sent = 3, Received = 0, Lost = 3 (100% loss),
```

Рис. 6: Проверка доступности оконечных устройств

Выполнение лабораторной работы

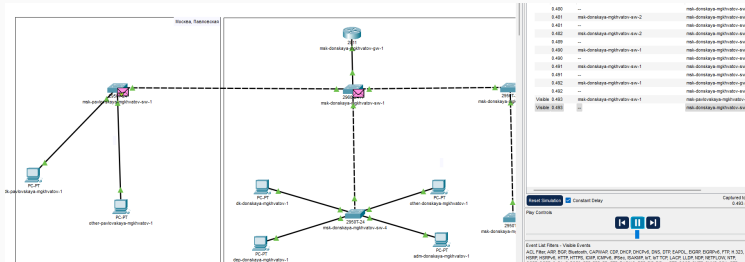


Рис. 7: Передвижения пакета ICMP по сети

Выполнение лабораторной работы

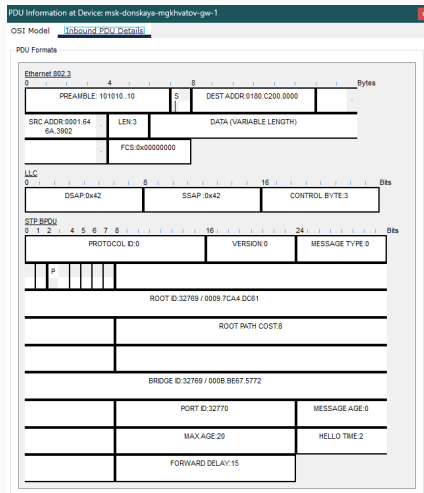


Рис. 8: Информация о PDU

Выводы

В результате выполнения лабораторной работы я настроил статическую маршрутизацию VLAN в сети