РОССИЙСКИЙ УНИВЕРСИТЕТ ДРУЖБЫ НАРОДОВ

Факультет физико-математических и естественных наук

Кафедра прикладной информатики и теории вероятностей

ОТЧЕТ
ПО ЛАБОРАТОРНОЙ РАБОТЕ № 14

Статическая маршрутизация в Интернете. Настройка

дисциплина: Администрирование локальных сетей

Студент: Ким Реачна

Группа: НПИбд 02-20

Студенческий билет: 1032205204

МОСКВА

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Цель работы

Настроить взаимодействие через сеть провайдера посредством статической маршрутизации локальной сети организации с сетью основного здания, расположенного в 42-м квартале в Москве, и сетью филиала, расположенного в г. Сочи.

Выполнение работы

Настройка линка между площадками

1. Настроить интерфейсов коммутатора provider-kim-sw-1 (рис. 1)

```
provider-kim-sw-1>en
Password:
provider-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
provider-kim-sw-1(config)#int f0/3
provider-kim-sw-1(config-if)#switchport mode trunk

provider-kim-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

provider-kim-sw-1(config-if)#exit
provider-kim-sw-1(config)#int f0/4
provider-kim-sw-1(config-if)#switchport mode trunk

provider-kim-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up

provider-kim-sw-1(config-if)#exit
provider-kim-sw-1(config)#vlan 5
provider-kim-sw-1(config-vlan)#name q42
provider-kim-sw-1(config-vlan)#exit
provider-kim-sw-1(config)#int vlan5
provider-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan5, changed state to up

provider-kim-sw-1(config-if)#no shutdown
provider-kim-sw-1(config-if)#exit
provider-kim-sw-1(config)#vlan 6
provider-kim-sw-1(config-vlan)#name sochi
provider-kim-sw-1(config-vlan)#exit
provider-kim-sw-1(config)#int vlan6
provider-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan6, changed state to up

provider-kim-sw-1(config-if)#no shutdown
provider-kim-sw-1(config-if)#exit
```

Рисунок 1

2. Настройка интерфейсов маршрутизатора msk-donskaya-kim-gw-1 (рис. 2)

```
msk-donskaya-kim-gw-1>en
Password:
msk-donskaya-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-kim-gw-1(config)#int f0/1.5
msk-donskaya-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/1.5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.5, changed state to up

msk-donskaya-kim-gw-1(config-subif)#encapsulation dot1Q 5
msk-donskaya-kim-gw-1(config-subif)#ip address 10.128.255.1 255.255.255.252
msk-donskaya-kim-gw-1(config-subif)#description q42
msk-donskaya-kim-gw-1(config-subif)#exit
msk-donskaya-kim-gw-1(config)#int f0/1.6
msk-donskaya-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/1.6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.6, changed state to up

msk-donskaya-kim-gw-1(config-subif)#encapsulation dot1Q 6
msk-donskaya-kim-gw-1(config-subif)#ip address 10.128.255.5 255.255.255.252
msk-donskaya-kim-gw-1(config-subif)#description sochi
msk-donskaya-kim-gw-1(config-subif)#exit
msk-donskaya-kim-gw-1(config)#exit
msk-donskaya-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-gw-1#wr m
Building configuration...
[OK]
msk-donskaya-kim-gw-1#
```

Рисунок 2

3. Настройка интерфейсов маршрутизатора msk-q42-kim-gw-1(рис. 3)

```
msk-q42-kim-gw-1>en
Password:
msk-q42-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-gw-1(config)#int f0/1
msk-q42-kim-gw-1(config-if)#no shutdown

msk-q42-kim-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

msk-q42-kim-gw-1(config-if)#exit
msk-q42-kim-gw-1(config)#int f0/1.5
msk-q42-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/1.5, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.5, changed state to up

msk-q42-kim-gw-1(config-subif)#encapsulation dot1Q 5
msk-q42-kim-gw-1(config-subif)#ip address 10.128.255.2 255.255.255.252
msk-q42-kim-gw-1(config-subif)#description donskaya
msk-q42-kim-gw-1(config-subif)#exit
msk-q42-kim-gw-1(config)#exit
msk-q42-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-q42-kim-gw-1#wr m
Building configuration...
[OK]
msk-q42-kim-gw-1#
```

Рисунок 3

4. Настройка интерфейсов коммутатора sch-sochi-kim-sw-1(рис. 4)

```
sch-sochi-kim-sw-1>en
Password:
sch-sochi-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-sw-1(config)#int f0/23
sch-sochi-kim-sw-1(config-if)#switchport mode trunk
sch-sochi-kim-sw-1(config-if)#exit
sch-sochi-kim-sw-1(config)#int f0/24
sch-sochi-kim-sw-1(config-if)#switchport mode trunk
sch-sochi-kim-sw-1(config-if)#exit
sch-sochi-kim-sw-1(config)#vlan 6
sch-sochi-kim-sw-1(config-vlan)#name sochi
sch-sochi-kim-sw-1(config-vlan)#exit
sch-sochi-kim-sw-1(config)#int vlan6
sch-sochi-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan6, changed state to up

sch-sochi-kim-sw-1(config-if)#no shutdown
sch-sochi-kim-sw-1(config-if)#exit
sch-sochi-kim-sw-1(config)#exit
sch-sochi-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-sw-1#wr m
Building configuration...
[OK]
```

Рисунок 4

5. Настройка интерфейсов маршрутизатора sch-sochi-kim-gw-1

```
sch-sochi-kim-gw-1>en
Password:
sch-sochi-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-gw-1(config)#int f0/0
sch-sochi-kim-gw-1(config-if)#no shutdown

sch-sochi-kim-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

sch-sochi-kim-gw-1(config-if)#exit
sch-sochi-kim-gw-1(config)#int f0/0.6
sch-sochi-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.6, changed state to up

sch-sochi-kim-gw-1(config-subif)#encapsulation dot1Q 6
sch-sochi-kim-gw-1(config-subif)#ip address 10.128.255.6 255.255.255.252
sch-sochi-kim-gw-1(config-subif)#description donskaya
sch-sochi-kim-gw-1(config-subif)#exit
sch-sochi-kim-gw-1(config)#exit
sch-sochi-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-gw-1#wr m
Building configuration...
[OK]
sch-sochi-kim-gw-1#
```

Рисунок 5

Настройка площадки 42-го квартала

6. Настройка интерфейсов маршрутизатора msk-q42-kim-gw-1(рис. 6)

```
msk-q42-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-gw-1(config)#int f0/0
msk-q42-kim-gw-1(config-if)#no shutdown

msk-q42-kim-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-q42-kim-gw-1(config-if)#exit
msk-q42-kim-gw-1(config)#int f0/0.201
msk-q42-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.201, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.201, changed state to up

msk-q42-kim-gw-1(config-subif)#encapsulation dot1Q 201
msk-q42-kim-gw-1(config-subif)#ip address 10.129.0.1 255.255.255.0
msk-q42-kim-gw-1(config-subif)#description q42-main
msk-q42-kim-gw-1(config-subif)#exit
msk-q42-kim-gw-1(config)#int f1/0
msk-q42-kim-gw-1(config-if)#no shutdown

msk-q42-kim-gw-1(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

msk-q42-kim-gw-1(config-if)#exit
msk-q42-kim-gw-1(config)#int f1/0.202
msk-q42-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet1/0.202, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0.202, changed state to up

msk-q42-kim-gw-1(config-subif)#encapsulation dot1Q 202
msk-q42-kim-gw-1(config-subif)#ip address 10.129.1.1 255.255.255.0
msk-q42-kim-gw-1(config-subif)#description q42-management
msk-q42-kim-gw-1(config-subif)#exit
msk-q42-kim-gw-1(config)#exit
msk-q42-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-q42-kim-gw-1#wr m
Building configuration...
```

Рисунок 6

7. Настройка интерфейсов коммутатора msk-q42-kim-sw-1(рис. 7)

```
msk-q42-kim-sw-1>en
Password:
msk-q42-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-sw-1(config)#int f0/24
msk-q42-kim-sw-1(config-if)#switchport mode trunk

msk-q42-kim-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/24, changed state to up

msk-q42-kim-sw-1(config-if)#exit
msk-q42-kim-sw-1(config)#int f0/1
msk-q42-kim-sw-1(config-if)#switchport mode access
msk-q42-kim-sw-1(config-if)#switchport access vlan 201
% Access VLAN does not exist. Creating vlan 201
msk-q42-kim-sw-1(config-if)#exit
msk-q42-kim-sw-1(config)#vlan 201
msk-q42-kim-sw-1(config-vlan)#name q42-main
msk-q42-kim-sw-1(config-vlan)#exit
msk-q42-kim-sw-1(config)#int vlan201
msk-q42-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan201, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan201, changed state to up

msk-q42-kim-sw-1(config-if)#no shutdown
msk-q42-kim-sw-1(config-if)#^Z
msk-q42-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-q42-kim-sw-1#wr m
Building configuration...
[OK]
```

Рисунок 7

8. Настройка интерфейсов маршрутизирующего коммутатора msk-hostel-kim-gw-1(рис. 8)

```
msk-hostel-kim-gw-1>en
Password:
msk-hostel-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-hostel-kim-gw-1(config)#int g0/1
msk-hostel-kim-gw-1(config-if)#switchport trunk encapsulation dotlq
msk-hostel-kim-gw-1(config-if)#switchport mode trunk

msk-hostel-kim-gw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

msk-hostel-kim-gw-1(config-if)#exit
msk-hostel-kim-gw-1(config)#int f0/1
msk-hostel-kim-gw-1(config-if)#switchport trunk encapsulation dotlq
msk-hostel-kim-gw-1(config-if)#switchport mode trunk

msk-hostel-kim-gw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

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

msk-hostel-kim-gw-1(config-if)#exit
msk-hostel-kim-gw-1(config)#vlan 202
msk-hostel-kim-gw-1(config-vlan)#name q42-management
msk-hostel-kim-gw-1(config-vlan)#exit
msk-hostel-kim-gw-1(config)#int vlan202
msk-hostel-kim-gw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan202, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan202, changed state to up

msk-hostel-kim-gw-1(config-if)#no shutdown
msk-hostel-kim-gw-1(config-if)#ip address 10.129.1.2 255.255.255.0
msk-hostel-kim-gw-1(config-if)#exit
msk-hostel-kim-gw-1(config)#vlan 301
msk-hostel-kim-gw-1(config-vlan)#name hostel-main
msk-hostel-kim-gw-1(config-vlan)#exit
msk-hostel-kim-gw-1(config)#int vlan301
msk-hostel-kim-gw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan301, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan301, changed state to up

msk-hostel-kim-gw-1(config-if)#no shutdown
msk-hostel-kim-gw-1(config-if)#ip address 10.129.128.1 255.255.255.0
msk-hostel-kim-gw-1(config-if)#exit
msk-hostel-kim-gw-1(config)#exit
msk-hostel-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-hostel-kim-gw-1#wr m
Building configuration...
[OK]
```

Рисунок 8

9. Настройка интерфейсов коммутатора msk-hostel-kim-sw-1 (рис. 9)

```
msk-hostel-kim-sw-1>en
Password:
msk-hostel-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-hostel-kim-sw-1(config)#int g0/1
msk-hostel-kim-sw-1(config-if)#switchport mode trunk
msk-hostel-kim-sw-1(config-if)#exit
msk-hostel-kim-sw-1(config)#int f0/1
msk-hostel-kim-sw-1(config-if)#switchport mode access
msk-hostel-kim-sw-1(config-if)#switchport access vlan 301
% Access VLAN does not exist. Creating vlan 301
msk-hostel-kim-sw-1(config-if)#exit
msk-hostel-kim-sw-1(config)#vlan 301
msk-hostel-kim-sw-1(config-vlan)#name hostel-main
msk-hostel-kim-sw-1(config-vlan)#exit
msk-hostel-kim-sw-1(config)#int vlan301
msk-hostel-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan301, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan301, changed state to up

msk-hostel-kim-sw-1(config-if)#no shutdown
msk-hostel-kim-sw-1(config-if)#^Z
msk-hostel-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-hostel-kim-sw-1#wr m
Building configuration...
[OK]
```

Рисунок 9

Настройка площадки в Сочи

10. Настроила интерфейсов коммутатора sch-sochi-kim-gw-1(рис. 10)

```
sch-sochi-kim-gw-1>en
Password:
sch-sochi-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-gw-1(config)#int f0/0.401
sch-sochi-kim-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

sch-sochi-kim-gw-1(config-subif)#encapsulation dot1Q 401
sch-sochi-kim-gw-1(config-subif)#ip address 10.130.0.1 255.255.255.0
sch-sochi-kim-gw-1(config-subif)#description sochi-main
sch-sochi-kim-gw-1(config-subif)#exit
sch-sochi-kim-gw-1(config)#int f0/0.402
sch-sochi-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.402, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.402, changed state to up

sch-sochi-kim-gw-1(config-subif)#encapsulation dot1Q 402
sch-sochi-kim-gw-1(config-subif)#ip address 10.130.1.1 255.255.255.0
sch-sochi-kim-gw-1(config-subif)#description sochi-management
sch-sochi-kim-gw-1(config-subif)#exit
sch-sochi-kim-gw-1(config)#exit
sch-sochi-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-gw-1#wr m
Building configuration...
```

Рисунок 10

11. Настройка интерфейсов коммутатора sch-sochi-kim-sw-1(рис. 11)

```
sch-sochi-kim-sw-1>en
Password:
sch-sochi-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-sw-1(config)#int f0/1
sch-sochi-kim-sw-1(config-if)#switchport mode access
sch-sochi-kim-sw-1(config-if)#switchport access vlan 401
% Access VLAN does not exist. Creating vlan 401
sch-sochi-kim-sw-1(config-if)#exit
sch-sochi-kim-sw-1(config)#vlan 401
sch-sochi-kim-sw-1(config-vlan)#name sochi-main
sch-sochi-kim-sw-1(config-vlan)#exit
sch-sochi-kim-sw-1(config)#int vlan401
sch-sochi-kim-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

sch-sochi-kim-sw-1(config-if)#no shutdown
sch-sochi-kim-sw-1(config-if)#exit
sch-sochi-kim-sw-1(config)#exit
sch-sochi-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-sw-1#wr m
Building configuration...
[OK]
```

Рисунок 11

Настройка маршрутизации между площадками

12. Настроила маршрутизатора msk-donskaya kim-gw-1 (рис. 12)

```
msk-donskaya-kim-gw-1>en
Password:
msk-donskaya-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-kim-gw-1(config)#ip route 10.129.0.0 255.255.0.0 10.128.255.2
msk-donskaya-kim-gw-1(config)#ip route 10.130.0.0 255.255.0.0 10.128.255.6
msk-donskaya-kim-gw-1(config)#^Z
msk-donskaya-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-gw-1#wr m
Building configuration...
[OK]
msk-donskaya-kim-gw-1#
```

Рисунок 12

13. Настройка маршрутизатора msk-q42-kim-gw-1 (рис. 13)

```
msk-q42-kim-gw-1>en
Password:
msk-q42-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-gw-1(config)#ip route 0.0.0.0 0.0.0.0 10.128.255.1
msk-q42-kim-gw-1(config)#^Z
msk-q42-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
```

Рисунок 13

14. Настройка маршрутизатора sch-sochi-kim-gw-1(рис. 14)

```
sch-sochi-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-gw-1(config)#ip route 0.0.0.0 0.0.0.0 10.128.255.5
sch-sochi-kim-gw-1(config)#^Z
sch-sochi-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-gw-1#wr m
Building configuration...
```

Рисунок 14

Настройка маршрутизации на 42 квартале

15. Настройка маршрутизатора msk-q42-kim-gw-1(рис. 15)

```
msk-q42-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-gw-1(config)#ip route 10.129.128.0 255.255.128.0 10.129.1.2
msk-q42-kim-gw-1(config)#^Z
msk-q42-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-q42-kim-gw-1#wr m
```

Рисунок 15

16. Настройка интерфейсов маршрутизирующего коммутатора msk-hostel-kim-gw-1(рис. 16)

```
msk-hostel-kim-gw-1>en
Password:
msk-hostel-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-hostel-kim-gw-1(config)#ip routing
msk-hostel-kim-gw-1(config)#ip route 0.0.0.0 0.0.0.0 10.129.1.1
msk-hostel-kim-gw-1(config)#^Z
msk-hostel-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-hostel-kim-gw-1#wr m
Building configuration...
```

Рисунок 16

17. Настройка NAT на маршрутизаторе msk-donskaya-kim-gw-1(рис. 17)

```
msk-donskaya-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-kim-gw-1(config)#int f0/1.5
msk-donskaya-kim-gw-1(config-subif)#ip nat inside
msk-donskaya-kim-gw-1(config-subif)#exit
msk-donskaya-kim-gw-1(config)#int f0/1.6
msk-donskaya-kim-gw-1(config-subif)#ip nat inside
msk-donskaya-kim-gw-1(config-subif)#exit
msk-donskaya-kim-gw-1(config)#ip access-list extended nat-inet
msk-donskaya-kim-gw-1(config-ext-nacl)#remark q42
msk-donskaya-kim-gw-1(config-ext-nacl)#permit ip host 10.129.0.200 any
msk-donskaya-kim-gw-1(config-ext-nacl)#permit ip host 10.129.128.200 any
msk-donskaya-kim-gw-1(config-ext-nacl)#remark sochi
msk-donskaya-kim-gw-1(config-ext-nacl)#permit ip host 10.130.0.200 any
msk-donskaya-kim-gw-1(config-ext-nacl)#exit
msk-donskaya-kim-gw-1(config)#exit
```

Рисунок 17

Конфигурации оборудования

- **provider-kim-sw-1**

```
!
version 15.0
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname provider-kim-sw-1
!
enable secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
!
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface fastethernet0/1
switchport mode trunk
!
interface fastethernet0/2
switchport mode trunk
!
interface fastethernet0/3
switchport mode trunk
!
interface fastethernet0/4
switchport mode trunk
!
```

```
interface fastethernet0/5
!
interface fastethernet0/6
!
interface fastethernet0/7
!
interface fastethernet0/8
!
interface fastethernet0/9
!
interface fastethernet0/10
!
interface fastethernet0/11
!
interface fastethernet0/12
!
interface fastethernet0/13
!
interface fastethernet0/14
!
interface fastethernet0/15
!
interface fastethernet0/16
!
interface fastethernet0/17
!
interface fastethernet0/18
!
interface fastethernet0/19
!
interface fastethernet0/20
!
interface fastethernet0/21
!
```

```
interface fastethernet0/22
!
interface fastethernet0/23
!
interface fastethernet0/24
!
interface gigabitethernet0/1
!
interface gigabitethernet0/2
!
interface vlan1
no ip address
shutdown
!
interface vlan4
no ip address
!
interface vlan5
no ip address
!
interface vlan6
no ip address
!
!
!
!
line con 0
password 7 0822455d0a16
login
!
line vty 0 4
password 7 0822455d0a16
login
line vty 5 15
```

login

!

!

!

!

end

- **msk-donskaya-kim-gw-1**

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-donskaya-kim-gw-1

!

!

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

ip dhcp excluded-address 10.128.3.1 10.128.3.29

ip dhcp excluded-address 10.128.3.200 10.128.3.254

ip dhcp excluded-address 10.128.4.1 10.128.4.29

ip dhcp excluded-address 10.128.4.200 10.128.4.254

ip dhcp excluded-address 10.128.5.1 10.128.5.29

ip dhcp excluded-address 10.128.5.200 10.128.5.254

ip dhcp excluded-address 10.128.6.1 10.128.6.29

ip dhcp excluded-address 10.128.6.200 10.128.6.254

!

ip dhcp pool dk

network 10.128.3.0 255.255.255.0

default-router 10.128.3.1

dns-server 10.128.0.5

ip dhcp pool departments

```
network 10.128.4.0 255.255.255.0
default-router 10.128.4.1
dns-server 10.128.0.5
ip dhcp pool adm
network 10.128.5.0 255.255.255.0
default-router 10.128.5.1
dns-server 10.128.0.5
ip dhcp pool other
network 10.128.6.0 255.255.255.0
default-router 10.128.6.1
dns-server 10.128.0.5
!
!
!
ip cef
no ipv6 cef
!
!
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
license udi pid cisco2811/k9 sn ftx1017lg55-
!
!
!
!
!
!
!
!
!
!
ip domain-name donskaya.rudn.edu
ip name-server 10.128.0.5
```

```
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface fastethernet0/0
no ip address
duplex auto
speed auto
!
interface fastethernet0/0.2
description management
encapsulation dot1q 2
ip address 10.128.1.1 255.255.255.0
ip access-group management-out out
!
interface fastethernet0/0.3
description servers
encapsulation dot1q 3
ip address 10.128.0.1 255.255.255.0
ip access-group servers-out out
ip nat inside
!
interface fastethernet0/0.101
description dk
encapsulation dot1q 101
ip address 10.128.3.1 255.255.255.0
ip nat inside
!
interface fastethernet0/0.102
```

```
description departments
encapsulation dot1q 102
ip address 10.128.4.1 255.255.255.0
ip nat inside
!
interface fastethernet0/0.103
description adm
encapsulation dot1q 103
ip address 10.128.5.1 255.255.255.0
ip nat inside
!
interface fastethernet0/0.104
description other
encapsulation dot1q 104
ip address 10.128.6.1 255.255.255.0
ip access-group other-in in
ip nat inside
!
interface fastethernet0/1
no ip address
duplex auto
speed auto
!
interface fastethernet0/1.4
description internet
encapsulation dot1q 4
ip address 198.51.100.2 255.255.255.240
ip nat outside
!
interface fastethernet0/1.5
description q42
encapsulation dot1q 5
ip address 10.128.255.1 255.255.255.252
ip nat inside
```

```
!
interface fastethernet0/1.6
description sochi
encapsulation dot1q 6
ip address 10.128.255.5 255.255.255.252
ip nat inside
!
interface vlan1
no ip address
shutdown
!
ip nat pool main-pool 198.51.100.2 198.51.100.14 netmask 255.255.255.240
ip nat inside source list nat-inet pool main-pool overload
ip nat inside source static tcp 10.128.0.2 80 198.51.100.2 80
ip nat inside source static tcp 10.128.0.3 20 198.51.100.3 20
ip nat inside source static tcp 10.128.0.3 21 198.51.100.3 21
ip nat inside source static tcp 10.128.0.4 25 198.51.100.4 25
ip nat inside source static tcp 10.128.0.4 110 198.51.100.4 110
ip nat inside source static tcp 10.128.6.200 3389 198.51.100.10 3389
ip classless
ip route 0.0.0.0 0.0.0.0 198.51.100.1
ip route 10.129.0.0 255.255.0.0 10.128.255.2
ip route 10.130.0.0 255.255.0.0 10.128.255.6
!
ip flow-export version 9
!
!
ip access-list extended servers-out
remark web
permit icmp any any
permit tcp any host 10.128.0.2 eq www
permit tcp host 10.128.6.200 host 10.128.0.2 range 20 ftp
permit tcp host 10.128.6.200 host 10.128.0.2 eq telnet
remark file
```

```
permit tcp 10.128.0.0 0.0.255.255 host 10.128.0.3 eq 445
permit tcp any host 10.128.0.3 range 20 ftp
remark mail
permit tcp any host 10.128.0.4 eq smtp
permit tcp any host 10.128.0.4 eq pop3
remark dns
permit udp 10.128.0.0 0.0.255.255 host 10.128.0.5 eq domain
ip access-list extended other-in
remark admin
permit ip host 10.128.6.200 any
ip access-list extended management-out
remark admin
permit ip host 10.128.6.200 10.128.1.0 0.0.0.255
ip access-list extended nat-inet
remark dk
permit tcp 10.128.3.0 0.0.0.255 host 192.0.2.11 eq www
permit tcp 10.128.3.0 0.0.0.255 host 192.0.2.12 eq www
remark departments
permit tcp 10.128.4.0 0.0.0.255 host 192.0.2.13 eq www
remark adm
permit tcp 10.128.5.0 0.0.0.255 host 192.0.2.14 eq www
remark admin
permit ip host 10.128.6.200 any
remark q42
permit ip host 10.129.0.200 any
permit ip host 10.129.128.200 any
remark sochi
permit ip host 10.130.0.200 any
!
!
!
!
!
line con 0
```

password 7 0822455d0a16

login

!

line aux 0

!

line vty 0 4

password 7 0822455d0a16

login

transport input ssh

!

!

!

end

- **msk-q42-kim-gw-1**

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-q42-kim-gw-1

!

!

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

!

!

!

!

no ip cef

no ipv6 cef

!

```
!
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
license udi pid cisco2811/k9 sn ftx101776dy-
!
!
!
!
!
!
!
!
!
ip domain-name q42.rudn.edu
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
interface fastethernet0/0
no ip address
duplex auto
speed auto
!
interface fastethernet0/0.201
description q42-main
encapsulation dot1q 201
ip address 10.129.0.1 255.255.255.0
```

```
!
interface fastethernet0/1
no ip address
duplex auto
speed auto
!
interface fastethernet0/1.5
description donskaya
encapsulation dot1q 5
ip address 10.128.255.2 255.255.255.252
!
interface fastethernet1/0
no ip address
duplex auto
speed auto
!
interface fastethernet1/0.202
description q42-management
encapsulation dot1q 202
ip address 10.129.1.1 255.255.255.0
!
interface fastethernet1/1
no ip address
duplex auto
speed auto
shutdown
!
interface vlan1
no ip address
shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.128.255.1
ip route 10.129.128.0 255.255.128.0 10.129.1.2
```

!

ip flow-export version 9

!

!

!

!

!

!

!

line con 0

password 7 0822455d0a16

login

!

line aux 0

!

line vty 0 4

password 7 0822455d0a16

login

transport input ssh

!

!

!

end

- **msk-q42-kim-sw-1**

!

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-q42-kim-sw-1

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

```
!
!
ip domain-name q42.rudn.edu
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface fastethernet0/1
switchport access vlan 201
switchport mode access
!
interface fastethernet0/2
!
interface fastethernet0/3
!
interface fastethernet0/4
!
interface fastethernet0/5
!
interface fastethernet0/6
!
interface fastethernet0/7
!
interface fastethernet0/8
!
interface fastethernet0/9
!
interface fastethernet0/10
!
interface fastethernet0/11
```

```
!
interface fastethernet0/12
!
interface fastethernet0/13
!
interface fastethernet0/14
!
interface fastethernet0/15
!
interface fastethernet0/16
!
interface fastethernet0/17
!
interface fastethernet0/18
!
interface fastethernet0/19
!
interface fastethernet0/20
!
interface fastethernet0/21
!
interface fastethernet0/22
!
interface fastethernet0/23
!
interface fastethernet0/24
switchport mode trunk
!
interface vlan1
no ip address
shutdown
!
interface vlan201
no ip address
```

!

!

!

!

line con 0

password 7 0822455d0a16

login

!

line vty 0 4

password 7 0822455d0a16

login

transport input ssh

line vty 5 15

login

!

!

!

!

end

- **msk-hostel-kim-gw-1**

!

version 12.2(37)se1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-hostel-kim-gw-1

!

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

!

!

```
!
ip routing
!
!
!
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
!
!
!
!
!
!
!
!
ip ssh version 2
ip domain-name hostel.rudn.edu
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface fastethernet0/1
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface fastethernet0/2
!
```

interface fastethernet0/3
!
interface fastethernet0/4
!
interface fastethernet0/5
!
interface fastethernet0/6
!
interface fastethernet0/7
!
interface fastethernet0/8
!
interface fastethernet0/9
!
interface fastethernet0/10
!
interface fastethernet0/11
!
interface fastethernet0/12
!
interface fastethernet0/13
!
interface fastethernet0/14
!
interface fastethernet0/15
!
interface fastethernet0/16
!
interface fastethernet0/17
!
interface fastethernet0/18
!
interface fastethernet0/19
!

```
interface fastethernet0/20
!
interface fastethernet0/21
!
interface fastethernet0/22
!
interface fastethernet0/23
!
interface fastethernet0/24
!
interface gigabitethernet0/1
switchport trunk encapsulation dot1q
switchport mode trunk
!
interface gigabitethernet0/2
!
interface vlan1
no ip address
shutdown
!
interface vlan202
mac-address 00d0.9754.6d01
ip address 10.129.1.2 255.255.255.0
!
interface vlan301
mac-address 00d0.9754.6d02
ip address 10.129.128.1 255.255.255.0
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.129.1.1
!
ip flow-export version 9
!
!
```

!

!

!

!

!

!

line con 0

password 7 0822455d0a16

login

!

line aux 0

!

line vty 0 4

password 7 0822455d0a16

login

transport input ssh

!

!

!

!

end

- **msk-hostel-kim-sw-1**

!

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-hostel-kim-sw-1

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

!

```
ip domain-name hostel.rudn.edu
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface fastethernet0/1
switchport access vlan 301
switchport mode access
!
interface fastethernet0/2
!
interface fastethernet0/3
!
interface fastethernet0/4
!
interface fastethernet0/5
!
interface fastethernet0/6
!
interface fastethernet0/7
!
interface fastethernet0/8
!
interface fastethernet0/9
!
interface fastethernet0/10
!
interface fastethernet0/11
!
interface fastethernet0/12
```

!
interface fastethernet0/13
!
interface fastethernet0/14
!
interface fastethernet0/15
!
interface fastethernet0/16
!
interface fastethernet0/17
!
interface fastethernet0/18
!
interface fastethernet0/19
!
interface fastethernet0/20
!
interface fastethernet0/21
!
interface fastethernet0/22
!
interface fastethernet0/23
!
interface fastethernet0/24
!
interface gigabitethernet0/1
switchport mode trunk
!
interface gigabitethernet0/2
!
interface vlan1
no ip address
shutdown
!

interface vlan301

no ip address

!

!

!

!

line con 0

password 7 0822455d0a16

login

!

line vty 0 4

password 7 0822455d0a16

login

transport input ssh

line vty 5 15

login

!

!

!

!

end

- **sch-sochi-kim-sw-1**

!

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname sch-sochi-kim-sw-1

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

!

```
ip domain-name sochi.rudn.edu
!
username admin secret 5 $1$merr$hx5rvt7rpnos4wqbxkx7m0
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface fastethernet0/1
switchport access vlan 401
switchport mode access
!
interface fastethernet0/2
!
interface fastethernet0/3
!
interface fastethernet0/4
!
interface fastethernet0/5
!
interface fastethernet0/6
!
interface fastethernet0/7
!
interface fastethernet0/8
!
interface fastethernet0/9
!
interface fastethernet0/10
!
interface fastethernet0/11
!
interface fastethernet0/12
```

```
!
interface fastethernet0/13
!
interface fastethernet0/14
!
interface fastethernet0/15
!
interface fastethernet0/16
!
interface fastethernet0/17
!
interface fastethernet0/18
!
interface fastethernet0/19
!
interface fastethernet0/20
!
interface fastethernet0/21
!
interface fastethernet0/22
!
interface fastethernet0/23
switchport mode trunk
!
interface fastethernet0/24
switchport mode trunk
!
interface vlan1
no ip address
shutdown
!
interface vlan6
no ip address
!
```

interface vlan401

no ip address

!

!

!

!

line con 0

password 7 0822455d0a16

login

!

line vty 0 4

password 7 0822455d0a16

login

transport input ssh

line vty 5 15

login

!

!

!

!

end

- **sch-sochi-kim-gw-1**

!

version 15.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname sch-sochi-kim-gw-1

!

!

!

enable secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

!

!

!

!

ip cef

no ipv6 cef

!

!

!

username admin secret 5 1merr$hx5rvt7rpnos4wqbxkx7m0

!

!

license udi pid cisco2811/k9 sn ftx1017t7k2-

!

!

!

!

!

!

!

!

!

!

ip domain-name sochi.rudn.edu

!

!

spanning-tree mode pvst

!

!

!

!

!

!

!

interface fastethernet0/0

```
no ip address
duplex auto
speed auto
!
interface fastethernet0/0.6
description donskaya
encapsulation dot1q 6
ip address 10.128.255.6 255.255.255.252
!
interface fastethernet0/0.401
description sochi-main
encapsulation dot1q 401
ip address 10.130.0.1 255.255.255.0
!
interface fastethernet0/0.402
description sochi-management
encapsulation dot1q 402
ip address 10.130.1.1 255.255.255.0
!
interface fastethernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface vlan1
no ip address
shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 10.128.255.5
!
ip flow-export version 9
!
```

```
!
!
!
!
!
!
line con 0
password 7 0822455d0a16
login
!
line aux 0
!
line vty 0 4
password 7 0822455d0a16
login
transport input ssh
!
!
!
end
```

Ответы на контрольные вопросы

1. Приведите пример настройки статической маршрутизации между двумя подсетями организации.

Необходимо задать IP шлюзов на интерфейсах, настроить sub-интерфейсы с тегированием кадром VLAN'ами и своими IP, затем настроить статические маршруты между сетями.

2. Опишите процесс обращения устройства из одного VLAN к устройству из другого VLAN.

1 устройство посылает фрейм на маршрутизатор, тот меняет MAC исходника на свой и перенаправляет фрейм 2 устройству.

3. Как проверить работоспособность маршрута?

ping на диаметрально противоположных устройствах друг к другу.

4. Как посмотреть таблицу маршрутизации?

show ip route

Вывод

Настроила взаимодействие через сеть провайдера посредством статической маршрутизации локальной сети организации с сетью основного здания, расположенного в 42-м квартале в Москве, и сетью филиала, расположенного в г. Сочи.