

# Лабораторная работа №14

Администрирование локальных сетей

---

Ищенко Ирина

Российский университет дружбы народов, Москва, Россия

- Ищенко Ирина Олеговна
- уч. группа: НПИбд-02-22
- 1132226529
- Факультет физико-математических и естественных наук

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 лабораторной работы

---

```
provider-ioithenko-sw-1>enable
Password:
provider-ioithenko-sw-1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
provider-ioithenko-sw-1(config)#interface f0/3
provider-ioithenko-sw-1(config-if)#switchport mode trunk
provider-ioithenko-sw-1(config-if)#exit
provider-ioithenko-sw-1(config)#interface f0/4
provider-ioithenko-sw-1(config-if)#switchport mode trunk
provider-ioithenko-sw-1(config-if)#exit
provider-ioithenko-sw-1(config)#vlan 5
provider-ioithenko-sw-1(config-vlan)#name q42
provider-ioithenko-sw-1(config-vlan)#exit
provider-ioithenko-sw-1(config)#interface vlan5
provider-ioithenko-sw-1(config-if)#no shutdown
provider-ioithenko-sw-1(config-if)#exit
provider-ioithenko-sw-1(config)#vlan 6
provider-ioithenko-sw-1(config-vlan)#name sochi
provider-ioithenko-sw-1(config-vlan)#exit
provider-ioithenko-sw-1(config)#interface vlan6
provider-ioithenko-sw-1(config-if)#no shutdown
provider-ioithenko-sw-1(config-if)#exit
provider-ioithenko-sw-1(config)#end
provider-ioithenko-sw-1#write memory
%LINK-5-CHANGED: Interface Vlan5, changed state to up

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

%LINK-5-CHANGED: Interface Vlan6, changed state to up

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

%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
provider-ioithenko-sw-1#
```

Рис. 1: Настройка интерфейсов

```
msk-donskaya-ioithenko-gw-1>enable
Password:
msk-donskaya-ioithenko-gw-1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-gw-1(config)#interface f0/1.5
msk-donskaya-ioithenko-gw-1(config-subif)#encapsulation dot1Q 5
msk-donskaya-ioithenko-gw-1(config-subif)#ip address 10.128.255.1 255.255.255.252
msk-donskaya-ioithenko-gw-1(config-subif)#description q42
msk-donskaya-ioithenko-gw-1(config-subif)#exit
msk-donskaya-ioithenko-gw-1(config)#interface f0/1.6
msk-donskaya-ioithenko-gw-1(config-subif)#encapsulation dot1Q 6
msk-donskaya-ioithenko-gw-1(config-subif)#ip address 10.128.255.5 255.255.255.252
msk-donskaya-ioithenko-gw-1(config-subif)#description sochi
msk-donskaya-ioithenko-gw-1(config-subif)#exit
msk-donskaya-ioithenko-gw-1(config)#end
msk-donskaya-ioithenko-gw-1#write memory
%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

%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

%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
msk-donskaya-ioithenko-gw-1#
```

Рис. 2: Настройка субинтерфейсов

```
msk-q42-ioithenko-gw-1>enable
Password:
msk-q42-ioithenko-gw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-q42-ioithenko-gw-1(config)#interface f0/1
msk-q42-ioithenko-gw-1(config-if)#no shutdown

msk-q42-ioithenko-gw-1(config-if)#exit
msk-q42-ioithenko-gw-1(config)#interface f0/1.5
msk-q42-ioithenko-gw-1(config-subif)#encapsulation dot1Q 5
msk-q42-ioithenko-gw-1(config-subif)#ip address 10.128.255.2 255.255.255.252
msk-q42-ioithenko-gw-1(config-subif)#description donskaya
msk-q42-ioithenko-gw-1(config-subif)#exit
msk-q42-ioithenko-gw-1(config)#end
msk-q42-ioithenko-gw-1#write memory
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

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

%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

%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
msk-q42-ioithenko-gw-1#
```

Рис. 3: Настройка интерфейсов

```
sch-sochi-ioithenko-sw-1>enable
Password:
sch-sochi-ioithenko-sw-1#enable
sch-sochi-ioithenko-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
sch-sochi-ioithenko-sw-1(config)#interface f0/23
sch-sochi-ioithenko-sw-1(config-if)#switchport mode trunk
sch-sochi-ioithenko-sw-1(config-if)#exit
sch-sochi-ioithenko-sw-1(config)#interface f0/24
sch-sochi-ioithenko-sw-1(config-if)#switchport mode trunk
sch-sochi-ioithenko-sw-1(config-if)#exit
sch-sochi-ioithenko-sw-1(config)#vlan 6
sch-sochi-ioithenko-sw-1(config-vlan)#name sochi
sch-sochi-ioithenko-sw-1(config-vlan)#exit
sch-sochi-ioithenko-sw-1(config)#interface vlan6
sch-sochi-ioithenko-sw-1(config-if)#no shutdown
sch-sochi-ioithenko-sw-1(config-if)#exit
sch-sochi-ioithenko-sw-1(config)#end
sch-sochi-ioithenko-sw-1#write memory
%LINK-5-CHANGED: Interface Vlan6, changed state to up

%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
sch-sochi-ioithenko-sw-1#
```

Рис. 4: Настройка интерфейсов



```
sch-sochi-ioithenko-gw-1>enable
Password:
sch-sochi-ioithenko-gw-1#enable
sch-sochi-ioithenko-gw-1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-ioithenko-gw-1(config)#interface f0/0
sch-sochi-ioithenko-gw-1(config-if)#no shutdown

sch-sochi-ioithenko-gw-1(config-if)#exit
sch-sochi-ioithenko-gw-1(config)#interface f0/0.6
sch-sochi-ioithenko-gw-1(config-subif)#encapsulation dot1Q 6
sch-sochi-ioithenko-gw-1(config-subif)#ip address 10.128.255.6 255.255.255.252
sch-sochi-ioithenko-gw-1(config-subif)#description donskaya
sch-sochi-ioithenko-gw-1(config-subif)#exit
sch-sochi-ioithenko-gw-1(config)#end
sch-sochi-ioithenko-gw-1#write memory
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINK-5-CHANGED: Interface FastEthernet0/0.6, changed state to up

%SYS-5-CONFIG_I: Configured from console by console

Building configuration...
[OK]
sch-sochi-ioithenko-gw-1#
```

---

Рис. 5: Настройка интерфейсов

```

msk-q42-ioithenko-gw-1(config)#int f0/0
msk-q42-ioithenko-gw-1(config-if)#no shutdown

msk-q42-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

msk-q42-ioithenko-gw-1(config-if)#exit
msk-q42-ioithenko-gw-1(config)#int f0/0.201
msk-q42-ioithenko-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-ioithenko-gw-1(config-subif)#encapsulation dot1Q 201
msk-q42-ioithenko-gw-1(config-subif)#ip address 10.129.0.1 255.255.255.0
msk-q42-ioithenko-gw-1(config-subif)#description q42-main
msk-q42-ioithenko-gw-1(config-subif)#exit
msk-q42-ioithenko-gw-1(config)#int f1/0
msk-q42-ioithenko-gw-1(config-if)#no shutdown
^
% Invalid input detected at '^' marker.

msk-q42-ioithenko-gw-1(config-if)#no shutdown

msk-q42-ioithenko-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-ioithenko-gw-1(config-if)#exit
msk-q42-ioithenko-gw-1(config)#int f1/0.202
msk-q42-ioithenko-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-ioithenko-gw-1(config-subif)#encapsulation dot1Q 202
msk-q42-ioithenko-gw-1(config-subif)#ip address 10.129.1.1 255.255.255.0
msk-q42-ioithenko-gw-1(config-subif)#description q42-management
msk-q42-ioithenko-gw-1(config-subif)#exit

```

Рис. 6: Настройка субинтерфейсов

```
msk-q42-ioithenko-sw-1>enable
Password:
msk-q42-ioithenko-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-q42-ioithenko-sw-1(config)#interface f0/24
msk-q42-ioithenko-sw-1(config-if)#switchport mode trunk
msk-q42-ioithenko-sw-1(config-if)#exit
msk-q42-ioithenko-sw-1(config)#interface f0/1
msk-q42-ioithenko-sw-1(config-if)#switchport mode access
msk-q42-ioithenko-sw-1(config-if)#switchport access vlan 201
% Access VLAN does not exist. Creating vlan 201
msk-q42-ioithenko-sw-1(config-if)#exit
msk-q42-ioithenko-sw-1(config)#vlan 201
msk-q42-ioithenko-sw-1(config-vlan)#name q42-main
msk-q42-ioithenko-sw-1(config-vlan)#exit
msk-q42-ioithenko-sw-1(config)#int vlan201
msk-q42-ioithenko-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-ioithenko-sw-1(config-if)#no shutdown
msk-q42-ioithenko-sw-1(config-if)#exit
```

Рис. 7: Доступ к VLAN 201

```

msk-hostel-ioithenko-gw-1>enable
Password:
msk-hostel-ioithenko-gw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-hostel-ioithenko-gw-1(config)#interface g0/1
msk-hostel-ioithenko-gw-1(config-if)#switchport trunk encapsulation dot1q
msk-hostel-ioithenko-gw-1(config-if)#switchport mode trunk

msk-hostel-ioithenko-gw-1(config-if)#exit
msk-hostel-ioithenko-gw-1(config)#interface f0/1
msk-hostel-ioithenko-gw-1(config-if)#switchport trunk encapsulation dot1q
msk-hostel-ioithenko-gw-1(config-if)#switchport mode trunk

msk-hostel-ioithenko-gw-1(config-if)#exit
%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

%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-ioithenko-gw-1(config)#vlan 202
msk-hostel-ioithenko-gw-1(config-vlan)#name q42-management
msk-hostel-ioithenko-gw-1(config-vlan)#exit
msk-hostel-ioithenko-gw-1(config)#int vlan202
msk-hostel-ioithenko-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-ioithenko-gw-1(config-if)#no shutdown
msk-hostel-ioithenko-gw-1(config-if)#ip address 10.129.1.2 255.255.255.0
msk-hostel-ioithenko-gw-1(config-if)#exit
msk-hostel-ioithenko-gw-1(config)#vlan 301
msk-hostel-ioithenko-gw-1(config-vlan)#name hostel-main
msk-hostel-ioithenko-gw-1(config-vlan)#exit
msk-hostel-ioithenko-gw-1(config)#int vlan301
msk-hostel-ioithenko-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-ioithenko-gw-1(config-if)#no shutdown
msk-hostel-ioithenko-gw-1(config-if)#ip address 10.129.128.1 255.255.255.0
msk-hostel-ioithenko-gw-1(config-if)#exit

```

Рис. 8: Настройка VLAN

```
mks-hostel-ioithenko-sw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
mks-hostel-ioithenko-sw-1(config)#int g0/1
mks-hostel-ioithenko-sw-1(config-if)#switchport mode trunk
mks-hostel-ioithenko-sw-1(config-if)#exit
mks-hostel-ioithenko-sw-1(config)#int f0/1
mks-hostel-ioithenko-sw-1(config-if)#switchport mode access
mks-hostel-ioithenko-sw-1(config-if)#switchport access vlan 301
% Access VLAN does not exist. Creating vlan 301
mks-hostel-ioithenko-sw-1(config-if)#exit
mks-hostel-ioithenko-sw-1(config)#vlan 301
mks-hostel-ioithenko-sw-1(config-vlan)#name hostel-main
mks-hostel-ioithenko-sw-1(config-vlan)#exit
mks-hostel-ioithenko-sw-1(config)#int vlan301
mks-hostel-ioithenko-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

mks-hostel-ioithenko-sw-1(config-if)#no shutdown
mks-hostel-ioithenko-sw-1(config-if)#exit
```

Рис. 9: Настройка интерфейсов

```

sch-sochi-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-ioithenko-gw-1(config)#int f0/0.401
sch-sochi-ioithenko-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.401, changed state to up

sch-sochi-ioithenko-gw-1(config-subif)#encapsulation dot1Q 401
sch-sochi-ioithenko-gw-1(config-subif)#ip address 10.130.0.1 255.255.255.0
                                     ^
% Invalid input detected at '^' marker.

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

sch-sochi-ioithenko-gw-1(config-subif)#encapsulation dot1Q 402
sch-sochi-ioithenko-gw-1(config-subif)#ip address 10.130.1.1 255.255.255.0
sch-sochi-ioithenko-gw-1(config-subif)#description sochi-management
sch-sochi-ioithenko-gw-1(config-subif)#exit

```

Рис. 10: Настройка интерфейсов

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

sch-sochi-ioithenko-sw-1(config-if)#no shutdown
sch-sochi-ioithenko-sw-1(config-if)#exit
sch-sochi-ioithenko-sw-1(config)#exit
sch-sochi-ioithenko-sw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
```

Рис. 11: Настройка интерфейсов

```
msk-donskaya-ioithenko-gw-1>enable
Password:
msk-donskaya-ioithenko-gw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-ioithenko-gw-1(config)#ip route 10.129.0.0 255.255.0.0 10.128.255.2
msk-donskaya-ioithenko-gw-1(config)#ip route 10.130.0.0 255.255.0.0 10.128.255.6
msk-donskaya-ioithenko-gw-1(config)#
```

Рис. 12: Маршрутизация между площадками



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

Рис. 13: Маршрутизация между площадками

```
sch-sochi-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-ioithenko-gw-1(config)#ip route 0.0.0.0 0.0.0.0 10.128.255.5
sch-sochi-ioithenko-gw-1(config)#exit
sch-sochi-ioithenko-gw-1#
```

Рис. 14: Маршрутизация между площадками

```
msk-q42-ioithenko-gw-1(config)#ip route 10.129.128.0 255.255.128.0 10.129.1.2
msk-q42-ioithenko-gw-1(config)#exit
msk-q42-ioithenko-gw-1#
%SYS-5-CONFIG-I: Configured from console by console
```

Рис. 15: Маршрутизация между площадками

```
msk-hostel-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-hostel-ioithenko-gw-1(config)#ip routing
msk-hostel-ioithenko-gw-1(config)#ip route 0.0.0.0 0.0.0.0 10.129.1.1
msk-hostel-ioithenko-gw-1(config)#exit
msk-hostel-ioithenko-gw-1#
```

Рис. 16: Маршрутизация между площадками

```
msk-donskaya-ioithenko-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-gw-1(config)#int f0/1.5
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#exit
msk-donskaya-ioithenko-gw-1(config)#int f0/1.6
msk-donskaya-ioithenko-gw-1(config-subif)#ip nat inside
msk-donskaya-ioithenko-gw-1(config-subif)#exit
msk-donskaya-ioithenko-gw-1(config)#ip access-list extended nat-inet
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark q42
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit ip host 10.129.0.200 any
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit ip host 10.129.128.200 any
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#remark sochi
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#permit ip host 10.130.0.200 any
msk-donskaya-ioithenko-gw-1(config-ext-nacl)#exit
msk-donskaya-ioithenko-gw-1(config)#exit
msk-donskaya-ioithenko-gw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-ioithenko-gw-1#
```

Рис. 17: Настройка NAT

В ходе выполнения лабораторной работы я 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.