

# **РОССИЙСКИЙ УНИВЕРСИТЕТ ДРУЖБЫ НАРОДОВ**

**Факультет физико-математических и естественных наук**

**Кафедра прикладной информатики и теории вероятностей**

## **ОТЧЕТ**

### **ПО ЛАБОРАТОРНОЙ РАБОТЕ № 5**

**Конфигурирование VLAN**

*дисциплина: Администрирование локальных сетей*

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**МОСКВА**

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## Цель работы

Получить основные навыки по настройке VLAN на коммутаторах сети.

## Выполнение работы

**Задание 1.** На коммутаторах сети настроить Trunk-порты на соответствующих интерфейсах, связывающих коммутаторы между собой.

- Конфигурация Trunk-порта коммутатор msk-donskaya-kim-sw-1 (Рис. 1):

```
msk-donskaya-kim-sw-1>enable
msk-donskaya-kim-sw-1#configure terminal
msk-donskaya-kim-sw-1(config)#interface g0/1
msk-donskaya-kim-sw-1(config-if)#switchport mode trunk
msk-donskaya-kim-sw-1(config)#interface g0/2
msk-donskaya-kim-sw-1(config-if)#switchport mode trunk

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

msk-donskaya-kim-sw-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-donskaya-kim-sw-1(config-if)#interface g0/2
msk-donskaya-kim-sw-1(config-if)#switchport mode trunk

msk-donskaya-kim-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

msk-donskaya-kim-sw-1(config-if)#exit
msk-donskaya-kim-sw-1(config)#exit
msk-donskaya-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-sw-1#write memory
Building configuration...
[OK]
```

*Рисунок 1*

- Конфигурация Trunk-порта коммутатор msk-donskaya-kim-sw-2 (Рис. 2):

```
msk-donskaya-kim-sw-2>enable
msk-donskaya-kim-sw-2#configure terminal
msk-donskaya-kim-sw-2(config)#interface g0/1
msk-donskaya-kim-sw-2(config-if)#switchport mode trunk
msk-donskaya-kim-sw-2(config-if)#interface g0/2
msk-donskaya-kim-sw-2(config-if)#switchport mode trunk
```

```

msk-donskaya-kim-sw-2>enable
Password:
msk-donskaya-kim-sw-2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-2(config)#interface g0/1
msk-donskaya-kim-sw-2(config-if)#switchport mode trunk
msk-donskaya-kim-sw-2(config-if)#interface g0/2
msk-donskaya-kim-sw-2(config-if)#switchport mode trunk

msk-donskaya-kim-sw-2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

msk-donskaya-kim-sw-2(config-if)#exit
msk-donskaya-kim-sw-2(config)#exit
msk-donskaya-kim-sw-2#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-sw-2#write memory
Building configuration...
[OK]

```

*Рисунок 2*

- Конфигурация Trunk-порта коммутатор msk-donskaya-kim-sw-3 (Рис. 3):

```

msk-donskaya-kim-sw-3>enable

msk-donskaya-kim-sw-3#configure terminal

msk-donskaya-kim-sw-3(config)#interface g0/1

msk-donskaya-kim-sw-3(config-if)#switchport mode trunk

```

```

msk-donskaya-kim-sw-3>enable
Password:
msk-donskaya-kim-sw-3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-3(config)#interface g0/1
msk-donskaya-kim-sw-3(config-if)#switchport mode trunk
msk-donskaya-kim-sw-3(config-if)#exit
msk-donskaya-kim-sw-3(config)#exit
msk-donskaya-kim-sw-3#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-sw-3#write memory
Building configuration...
[OK]

```

*Рисунок 3*

- Конфигурация Trunk-порта коммутатор msk-donskaya-kim-sw-4 (Рис. 4)

```

msk-donskaya-kim-sw-4>enable

msk-donskaya-kim-sw-4#configure terminal

msk-donskaya-kim-sw-4(config)#interface g0/1

msk-donskaya-kim-sw-4(config-if)#switchport mode trunk

```

```

msk-donskaya-kim-sw-4>enable
Password:
msk-donskaya-kim-sw-4#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-4(config)#interface g0/1
msk-donskaya-kim-sw-4(config-if)#switchport mode trunk
msk-donskaya-kim-sw-4(config-if)#exit
msk-donskaya-kim-sw-4(config)#exit
msk-donskaya-kim-sw-4#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-sw-4#write memory
Building configuration...
[OK]

```

*Рисунок 4*

- Конфигурация Trunk-порта коммутатор msk-pavlovskaya-kim-sw-1(Рис. 5):

```

msk-pavlovskaya-kim-sw-1>en
msk-pavlovskaya-kim-sw-1#conf terminal
msk-pavlovskaya-kim-sw-1(config)#interface f0/24
msk-pavlovskaya-kim-sw-1(config-if)#switchport mode trunk

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

```

*Рисунок 5*

**Задание 2:** Коммутатор msk-donskaya-sw-1 настроить как VTP-сервер и прописать на нём номера и названия VLAN.

Пример конфигурации VTP:

```

msk-donskaya-sw-1>enable
msk-donskaya-sw-1#configure terminal
msk-donskaya-sw-1(config)#vtp mode server
msk-donskaya-sw-1(config)#vtp domain donsкаya
msk-donskaya-sw-1(config)#vtp password cisco
msk-donskaya-sw-1(config-vlan)#vlan 2
msk-donskaya-sw-1(config-vlan)#name management
msk-donskaya-sw-1(config-vlan)#vlan 3
msk-donskaya-sw-1(config-vlan)#name servers
msk-donskaya-sw-1(config-vlan)#vlan 101
msk-donskaya-sw-1(config-vlan)#name dk

```

```
msk-donskaya-sw-1(config-vlan)#vlan 102
msk-donskaya-sw-1(config-vlan)#name departments
msk-donskaya-sw-1(config-vlan)#vlan 103
msk-donskaya-sw-1(config-vlan)#name adm
msk-donskaya-sw-1(config-vlan)#vlan 104
msk-donskaya-sw-1(config-vlan)#name other
```

- Конфигурация VTP коммутатор msk-donskaya-kim-sw-1 (Рис. 6):

```
msk-donskaya-kim-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-1(config)#vtp mode server
Device mode already VTP SERVER.
msk-donskaya-kim-sw-1(config)#vtp domain donsкаya
Changing VTP domain name from NULL to donsкаya
msk-donskaya-kim-sw-1(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-donskaya-kim-sw-1(config)#vlan 2
msk-donskaya-kim-sw-1(config-vlan)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

msk-donskaya-kim-sw-1(config-vlan)#name management
msk-donskaya-kim-sw-1(config-vlan)#vlan 3
msk-donskaya-kim-sw-1(config-vlan)#name servers
msk-donskaya-kim-sw-1(config-vlan)#vlan 101
msk-donskaya-kim-sw-1(config-vlan)#name dk
msk-donskaya-kim-sw-1(config-vlan)#vlan 102
msk-donskaya-kim-sw-1(config-vlan)#name departments
msk-donskaya-kim-sw-1(config-vlan)#vlan 103
msk-donskaya-kim-sw-1(config-vlan)#name adm
msk-donskaya-kim-sw-1(config-vlan)#vlan 104
msk-donskaya-kim-sw-1(config-vlan)#name other
```

*Рисунок 6*

**Задание 3:** Коммутаторы msk-donskaya-sw-2, msk-donskaya-sw-4, msk-pavlovskaya-sw-1 настроить как VTP-клиенты, на интерфейсах указать принадлежность к соответствующему VLAN.

Пример конфигурации VTP-клиенты:

```
msk-donskaya-kim-sw-2#configure terminal
msk-donskaya-kim-sw-2(config)#vtp domain donsкаya
msk-donskaya-kim-sw-2(config)#vtp mode client
msk-donskaya-kim-sw-2(config)#vtp password cisco
```

- Конфигурация VTP-клиенты коммутатор msk-donskaya-kim-sw-2 (Рис. 7):

```

msk-donskaya-kim-sw-2(config)#vtp domain donskaya
Domain name already set to donskaya.
msk-donskaya-kim-sw-2(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-kim-sw-2(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-donskaya-kim-sw-2(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

```

*Рисунок 7*

- Конфигурация VTP-клиенты коммутатор msk-donskaya-kim-sw-3 (Рис. 8):

```

msk-donskaya-kim-sw-3>enable
Password:
msk-donskaya-kim-sw-3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-3(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-kim-sw-3(config)#vtp domain donskaya
Domain name already set to donskaya.
msk-donskaya-kim-sw-3(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-donskaya-kim-sw-3(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

```

*Рисунок 8*

- Конфигурация VTP-клиенты коммутатор msk-donskaya-kim-sw-4 (Рис. 9):

```

msk-donskaya-kim-sw-4>enable
Password:
Password:
msk-donskaya-kim-sw-4#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-4(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-kim-sw-4(config)#vtp domain donskaya
Domain name already set to donskaya.
msk-donskaya-kim-sw-4(config)#vtp password cisco
^
% Invalid input detected at '^' marker.

msk-donskaya-kim-sw-4(config)#vtp password cisco
Setting device VLAN database password to cisco

```

*Рисунок 9*

- Конфигурация VTP-клиенты коммутатор msk-pavlovskaya-kim-sw-1 (Рис. 10):

```

msk-pavlovskaya-kim-sw-1>enable
Password:
msk-pavlovskaya-kim-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-pavlovskaya-kim-sw-1(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-pavlovskaya-kim-sw-1(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-pavlovskaya-kim-sw-1(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up

```

Рисунок 10

**Задание 4:** На серверах прописать IP-адреса, конфигурации диапазонов портов.

Пример конфигурации диапазона портов:

```

msk-donskaya-sw-4#conf terminal
msk-donskaya-sw-4(config)#vtp mode client
msk-donskaya-sw-4(config)#interface range f0/1 - 5
msk-donskaya-sw-4(config-if-range)#switchport mode access
msk-donskaya-sw-4(config-if-range)#switchport access vlan 101

```

- Конфигурация диапазона портов коммутатор msk-donskaya-kim-sw-4 (Рис. 11):

```

msk-donskaya-kim-sw-4#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-4(config)#interface range f0/1 - 5
msk-donskaya-kim-sw-4(config-if-range)#switchport mode access
msk-donskaya-kim-sw-4(config-if-range)#switch access vlan101
^
% Invalid input detected at '^' marker.

msk-donskaya-kim-sw-4(config-if-range)#switch access vlan 101
msk-donskaya-kim-sw-4(config-if-range)#interface range f0/6 - 10
msk-donskaya-kim-sw-4(config-if-range)#switchport mode access
msk-donskaya-kim-sw-4(config-if-range)#switch access vlan 102
msk-donskaya-kim-sw-4(config-if-range)#interface range f0/11 - 15
msk-donskaya-kim-sw-4(config-if-range)#switchport mode access
msk-donskaya-kim-sw-4(config-if-range)#switch access vlan 103
msk-donskaya-kim-sw-4(config-if-range)#interface range f0/16 - 24
msk-donskaya-kim-sw-4(config-if-range)#switchport mode access
msk-donskaya-kim-sw-4(config-if-range)#switch access vlan 104

```

Рисунок 11

- Конфигурация диапазона портов коммутатор msk-donskaya-kim-sw-3 (Рис. 12):

```

msk-donskaya-kim-sw-3#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-3(config)#interface f0/1
msk-donskaya-kim-sw-3(config-if)#switchport mode access
msk-donskaya-kim-sw-3(config-if)#switchport access vlan 3

```

Рисунок 12

- Конфигурация диапазона портов коммутатор msk-donskaya-kim-sw-2 (Рис. 13):



```
msk-donskaya-kim-sw-2#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-kim-sw-2(config)#interface range f0/1 - 2
msk-donskaya-kim-sw-2(config-if-range)#switchport mode access
msk-donskaya-kim-sw-2(config-if-range)#switchport access vlan 3
```

Рисунок 13

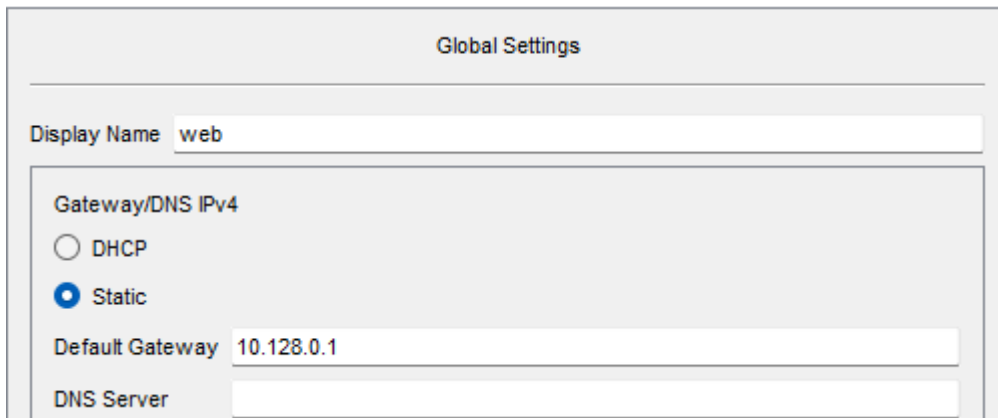
- Конфигурация диапазона портов коммутатор msk-pavlovskaya-kim-sw-1 (Рис. 14):

```
msk-pavlovskaya-kim-sw-1#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-pavlovskaya-kim-sw-1(config)#interface range f0/1 - 15
msk-pavlovskaya-kim-sw-1(config-if-range)#switchport mode access
msk-pavlovskaya-kim-sw-1(config-if-range)#switchport access vlan 101
msk-pavlovskaya-kim-sw-1(config-if-range)#interface f0/20
msk-pavlovskaya-kim-sw-1(config-if)#switchport mode access
msk-pavlovskaya-kim-sw-1(config-if)#switchport access vlan 104
```

Рисунок 14

**Задание 5:** На оконечных устройствах указать соответствующий адрес шлюза и прописать статические IP-адреса из диапазона соответствующей сети, следуя регламенту выделения ip-адресов.

- **Web:**



Global Settings

Display Name

Gateway/DNS IPv4

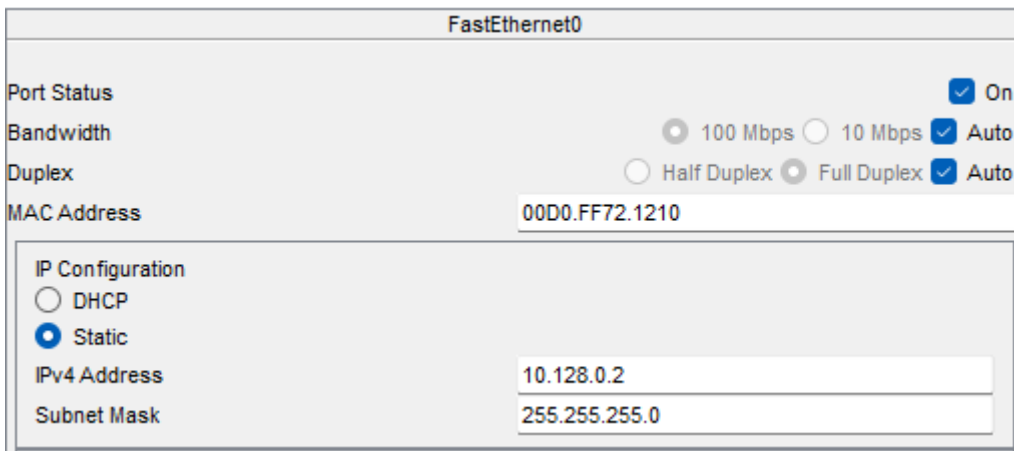
☐ DHCP

☒ Static

Default Gateway

DNS Server

Рисунок 15: default-gateway



FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

Subnet Mask

Рисунок 16: IP



- **File**

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

Рисунок 17: default-gateway

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

Subnet Mask

Рисунок 18: IP

- **Mail**

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

Рисунок 19: default-gateway

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0007.ECC7.9411
<div>IP Configuration</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>IPv4 Address</div> <div>10.128.0.4</div> <div>Subnet Mask</div> <div>255.255.255.0</div>	

Рисунок 20: IP

- Dk-donskaya-kim-1:**

Global Settings	
Display Name	dk-donskaya-kim-1
Interfaces	FastEthernet0
<div>Gateway/DNS IPv4</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>Default Gateway</div> <div>10.128.3.1</div> <div>DNS Server</div> <div></div>	

Рисунок 21: default-gateway

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0001.C702.8DE9
<div>IP Configuration</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>IPv4 Address</div> <div>10.128.3.201</div> <div>Subnet Mask</div> <div>255.255.255.0</div>	

Рисунок 22: IP

- Dep-donskaya-kim-1:**

**Global Settings**

---

Display Name

Interfaces

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

*Рисунок 23: default-gateway*

**FastEthernet0**

---

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☐ DHCP

☒ Static

IPv4 Address

Subnet Mask

*Рисунок 24: IP*

- **Adm-donskaya-kim-1:**

**Global Settings**

---

Display Name

Interfaces

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

*Рисунок 25: default-gateway*

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0002.16A9.36E3
<div>IP Configuration</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>           IPv4 Address <input type="text" value="10.128.5.201"/> </div> <div>           Subnet Mask <input type="text" value="255.255.255.0"/> </div>	

Рисунок 26: IP

- **Other-donskaya-kim-1:**

Global Settings	
Display Name	<input type="text" value="other-donskaya-kim-1"/>
Interfaces	<input type="text" value="FastEthernet0"/>
<div>Gateway/DNS IPv4</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>           Default Gateway <input type="text" value="10.128.6.1"/> </div> <div>           DNS Server <input type="text"/> </div>	

Рисунок 27: default-gateway

FastEthernet0	
Port Status	<input checked="" type="checkbox"/> On
Bandwidth	<input checked="" type="radio"/> 100 Mbps <input type="radio"/> 10 Mbps <input checked="" type="checkbox"/> Auto
Duplex	<input type="radio"/> Half Duplex <input checked="" type="radio"/> Full Duplex <input checked="" type="checkbox"/> Auto
MAC Address	0010.1131.0EB4
<div>IP Configuration</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>           IPv4 Address <input type="text" value="10.128.6.201"/> </div> <div>           Subnet Mask <input type="text" value="255.255.255.0"/> </div>	

Рисунок 28: IP

- **Dk-pavlovskaya-kim-1:**

Global Settings

Display Name: dk-pavlovskaya-kim-1

Interfaces: FastEthernet0

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway: 10.128.3.1

DNS Server:

Рисунок 29: default-gateway

FastEthernet0

Port Status: ☒ On

Bandwidth: ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address: 0001.6497.D236

IP Configuration

☐ DHCP

☒ Static

IPv4 Address: 10.128.3.202

Subnet Mask: 255.255.255.0

Рисунок 30: IP

- **Other-pavlovskaya-kim-1:**

Global Settings

Display Name: other-pavlovskaya-kim-1

Interfaces: FastEthernet0

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway: 10.128.6.1

DNS Server:

Рисунок 31: default-gateway

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.58CB.6988

IP Configuration

☐ DHCP

☒ Static

IPv4 Address 10.128.6.202

Subnet Mask 255.255.255.0

Рисунок 32: IP

**Задание 6:** Проверить доступность устройств, принадлежащих одному VLAN, и недоступность устройств, принадлежащих разным VLAN.

```

dk-donskaya-kim-1
Physical Config Desktop Programming Attributes
Command Prompt
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 10.128.3.202

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<1ms TTL=128
Reply from 10.128.3.202: bytes=32 time<1ms TTL=128
Reply from 10.128.3.202: bytes=32 time<1ms 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 = 1ms, Average = 0ms
  
```

Рисунок 33: ping 10.128.3.202

```

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),
  
```

Рисунок 34: ping 10.128.4.201

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	dk-donskaya-kim-1	ICMP
	0.001	dk-donskaya-kim-1	msk-donskaya-kim-sw-4	ICMP
	0.002	msk-donskaya-kim-sw-4	msk-donskaya-kim-sw-1	ICMP
	0.003	msk-donskaya-kim-sw-1	msk-pavlovskaya-kim-sw-1	ICMP
	0.004	msk-pavlovskaya-kim-sw-1	dk-pavlovskaya-kim-1	ICMP
	0.005	dk-pavlovskaya-kim-1	msk-pavlovskaya-kim-sw-1	ICMP
	0.006	msk-pavlovskaya-kim-sw-1	msk-donskaya-kim-sw-1	ICMP
	0.007	msk-donskaya-kim-sw-1	msk-donskaya-kim-sw-4	ICMP
	0.008	msk-donskaya-kim-sw-4	dk-donskaya-kim-1	ICMP

Рисунок 35: simulation panel

PDU Information at Device: msk-donskaya-kim-sw-4

OSI Model   Inbound PDU Details   Outbound PDU Details

PDU Formats

EthernetII

048Bytes

PREAMBLE: 101010..10

SFD

DEST ADDR: 0001.6497.D236

SRC ADDR: 0001.C702.8DE9

TYPE: 0x0800

DATA (VARIABLE LENGTH)

FCS: 0x00000000

IP

048162024Bits

VER: 4

IHL: 5

DSCP: 0x00

TL: 28

ID: 0x0009

FLAGS: 0x0

FRAG OFFSET: 0x000

TTL: 255

PRO: 0x01

CHKSUM

SRC IP: 10.128.3.201

DST IP: 10.128.3.202

DATA (VARIABLE LENGTH)

ICMP

0816Bits

TYPE: 0x08

CODE: 0x00

CHECKSUM

ID: 0x0004

SEQ NUMBER: 9

Variable Size PDU

0816Bytes

DATA (VARIABLE LENGTH)

Рисунок 36: PDU information



## Конфигурации оборудования

- msk-donskaya-kim-sw-1

!

version 15.0

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-donskaya-kim-sw-1

!

enable secret 5 \$1\$mERr\$hX5rVt7rPNoS4wqbXKX7m0

!

!

!

ip domain-name dons kaya.rudn.edu

!

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

!

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
switchport mode trunk
!
interface Vlan1
no ip address
shutdown
!
interface Vlan2
ip address 10.128.1.2 255.255.255.0
!
ip default
-gateway 10.128.1.1
!!!!
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-donskaya-kim-sw-2**

!

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-donskaya-kim-sw-2

!

enable secret 5 \$1\$mERr\$hX5rVt7rPNoS4wqbXKX7m0

!

!

!

ip domain-name dons kaya.rudn.edu

!

username admin secret 5 \$1\$mERr\$hX5rVt7rPNoS4wqbXKX7m0

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

switchport access vlan 3

switchport mode access

!

interface FastEthernet0/2

switchport access vlan 3

switchport mode access

!

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  
switchport mode trunk  
!  
interface Vlan1  
no ip address  
shutdown  
!  
interface Vlan2  
ip address 10.128.1.3 255.255.255.0  
!  
ip default  
-gateway 10.128.1.1  
!  
!  
!  
!  
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-donskaya-kim-sw-3**

!

version 12.1

no service timestamps log datetime msec

no service timestamps debug datetime msec

service password-encryption

!

hostname msk-donskaya-kim-sw-3

!

enable secret 5 \$1\$mERr\$hx5rVt7rPNoS4wqbXKX7m0

!

!

!

ip domain-name dons kaya.rudn.edu

!

username admin secret 5 \$1\$mERr\$hx5rVt7rPNoS4wqbXKX7m0

!

!

!

spanning

-tree mode pvst

spanning

-tree extend system

-id

!

interface FastEthernet0/1

switchport access vlan 3



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 Vlan2
ip address 10.128.1.4 255.255.255.0
!
ip default-gateway 10.128.1.1
!
!
!
!
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-donskaya-kim-sw-4**

```
!  
version 12.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
service password-encryption  
!  
hostname msk-donskaya-kim-sw-4  
!  
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0  
!  
!  
!  
ip domain-name dons kaya.rudn.edu  
!  
username admin secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0  
!  
!  
!  
spanning-tree mode pvst  
spanning-tree extend system-id  
!
```

```
interface FastEthernet0/1
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/2
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/3
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/4
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/5
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/6
switchport access vlan 102
switchport mode access
!
interface FastEthernet0/7
switchport access vlan 102
switchport mode access
!
interface FastEthernet0/8
switchport access vlan 102
switchport mode access
!
interface FastEthernet0/9
switchport access vlan 102
```

```
switchport mode access
!
interface FastEthernet0/10
switchport access vlan 102
switchport mode access
!
interface FastEthernet0/11
switchport access vlan 103
switchport mode access
!
interface FastEthernet0/12
switchport access vlan 103
switchport mode access
!
interface FastEthernet0/13
switchport access vlan 103
switchport mode access
!
interface FastEthernet0/14
switchport access vlan 103
switchport mode access
!
interface FastEthernet0/15
switchport access vlan 103
switchport mode access
!
interface FastEthernet0/16
switchport access vlan 104
switchport mode access
!
interface FastEthernet0/17
switchport access vlan 104
switchport mode access
!
```

```
interface FastEthernet0/18
switchport access vlan 104
switchport mode access
```

!

```
interface FastEthernet0/19
switchport access vlan 104
switchport mode access
```

!

```
interface FastEthernet0/20
switchport access vlan 104
switchport mode access
```

!

```
interface FastEthernet0/21
switchport access vlan 104
switchport mode access
```

!

```
interface FastEthernet0/22
switchport access vlan 104
switchport mode access
```

!

```
interface FastEthernet0/23
switchport access vlan 104
switchport mode access
```

!

```
interface FastEthernet0/24
switchport access vlan 104
switchport mode access
```

!

```
interface GigabitEthernet0/1
switchport mode trunk
```

!

```
interface GigabitEthernet0/2
```

!

```
interface Vlan1
```

```

no ip address
shutdown
!
interface Vlan2
ip address 10.128.1.5 255.255.255.0
!
ip default
-gateway 10.128.1.1
!
!
!
!
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-pavlovskaya-kim-sw-1
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!

```



```
hostname msk-pavlovskaya-kim-sw-1
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
ip domain-name dons kaya.rudn.edu
!
username admin secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/2
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/3
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/4
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/5
switchport access vlan 101
switchport mode access
```

```
!  
interface FastEthernet0/6  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/7  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/8  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/9  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/10  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/11  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/12  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/13  
switchport access vlan 101  
switchport mode access  
!  
interface FastEthernet0/14
```

```
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/15
switchport access vlan 101
switchport mode access
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
switchport access vlan 104
switchport mode access
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
switchport mode trunk
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
```

```
shutdown
!
interface Vlan2
ip address 10.128.1.6 255.255.255.0
!
ip default
-gateway 10.128.1.1
!
!
!
!
line con 0
password 7 0822455D0A16
login
!
line vty 0 4
password 7 0822455D0A16
login
transport input ssh
line vty 5 15
login
!
!
!
!
end
```

## **Ответы на контрольные вопросы**

1. Какая команда используется для просмотра списка VLAN на сетевом устройстве?  
show vlan
2. Охарактеризуйте VLAN Trunking Protocol (VTP). Приведите перечень команд для настройки и просмотра информации о VLAN. Протокол локальной сети для обмена информацией о VLAN на выбранном транковом порту.

```
switchport mode trunk/access
```

```
switchport access vlan ...
```

```
vtp mode server/client
```

vtp domain ...  
vtp password ...  
vlan ...  
name ...

3. Охарактеризуйте Internet Control Message Protocol (ICMP).

Используется для передачи сообщений об ошибках и других исключительных ситуациях, возникших при передаче данных. Также на ICMP возлагаются некоторые сервисные функции.

4. Охарактеризуйте Address Resolution Protocol (ARP).

Используется для определения MAC-адреса по IP-адресу другого компьютера.

5. Что такое MAC-адрес? Какова его структура?

Уникальный идентификатор, присваиваемый каждой единице активного оборудования или некоторым их интерфейсам в компьютерных сетях Ethernet.

**Вывод:**

Получила основные навыки по настройке VLAN на коммутаторах сети