

Лабораторная Работа №5. Конфигурирование VLAN

Администрирование локальных сетей

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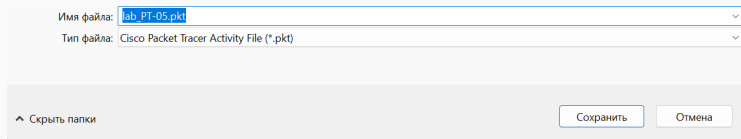


Figure 1: Открытие проекта lab_PT-05.pkt.

Настройка Trunk-портов

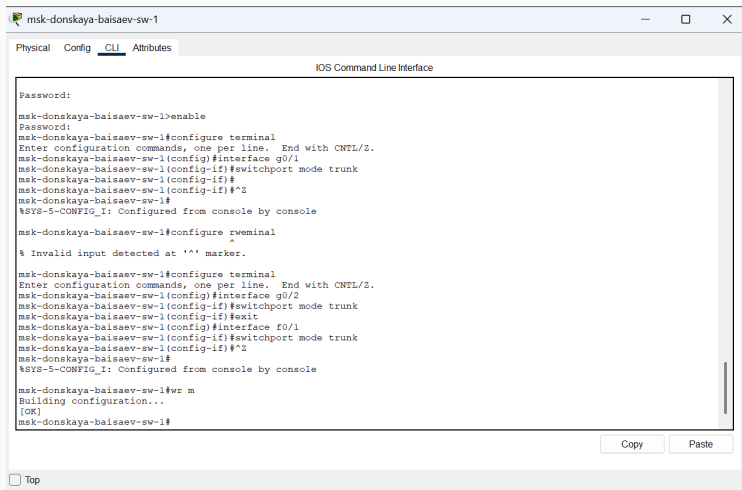
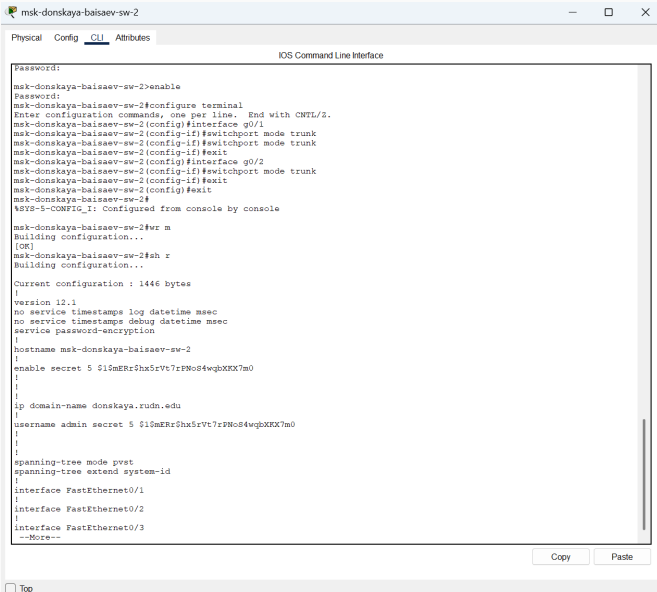


Figure 2: Настройка Trunk-портов на коммутаторе msk-donskaya-baisaev-sw-1.

Настройка Trunk-портов



The screenshot shows a Cisco IOS Command Line Interface window titled "msk-donskaya-baisaev-sw-2". The window has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The main area displays the following commands and their outputs:

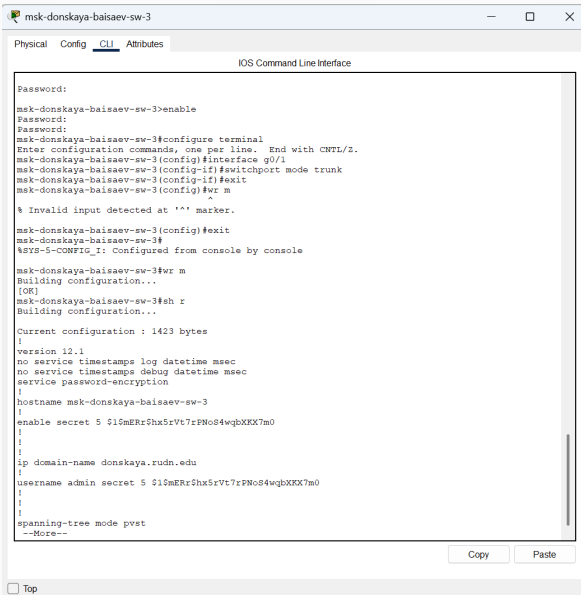
```
msk-donskaya-baisaev-sw-2>enable
Password:
msk-donskaya-baisaev-sw-2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-baisaev-sw-2(config)#interface g0/1
msk-donskaya-baisaev-sw-2(config-if)#switchport mode trunk
msk-donskaya-baisaev-sw-2(config-if)#switchport mode trunk
msk-donskaya-baisaev-sw-2(config-if)#exit
msk-donskaya-baisaev-sw-2(config)#interface g0/2
msk-donskaya-baisaev-sw-2(config-if)#switchport mode trunk
msk-donskaya-baisaev-sw-2(config-if)#exit
msk-donskaya-baisaev-sw-2(config)#exit
msk-donskaya-baisaev-sw-2#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-baisaev-sw-2#wr m
Building configuration...
[OK]
msk-donskaya-baisaev-sw-2#sh r
Building configuration...

Current configuration : 1446 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-baisaev-sw-2
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXFK7m0
!
!
!
ip domain-name donsкаya.rudn.edu
!
username admin secret 5 $1$mERr$hx5rVt7rPNoS4wqbXFK7m0
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
--More--
```

At the bottom right of the window, there are "Copy" and "Paste" buttons. At the bottom left, there is a "Top" button.

Настройка Trunk-портов



The screenshot shows a web-based configuration interface for a network device named 'msk-donskaya-baisaev-sw-3'. The interface has tabs for 'Physical', 'Config', 'CLI', and 'Attributes', with 'CLI' currently selected. The main area displays the 'IOS Command Line Interface' with a series of commands and their outputs. The commands include enabling the device, configuring the terminal, setting interface g0/1 to trunk mode, exiting configuration mode, and saving the configuration. The output shows the current configuration in bytes and a detailed list of configuration parameters including version, timestamps, encryption, hostname, enable secret, domain name, username, and spanning-tree mode.

```
msk-donskaya-baisaev-sw-3>enable
Password:
msk-donskaya-baisaev-sw-3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-baisaev-sw-3(config)#interface g0/1
msk-donskaya-baisaev-sw-3(config-if)#switchport mode trunk
msk-donskaya-baisaev-sw-3(config-if)#exit
msk-donskaya-baisaev-sw-3(config)#wr m
^
% Invalid input detected at '^' marker.

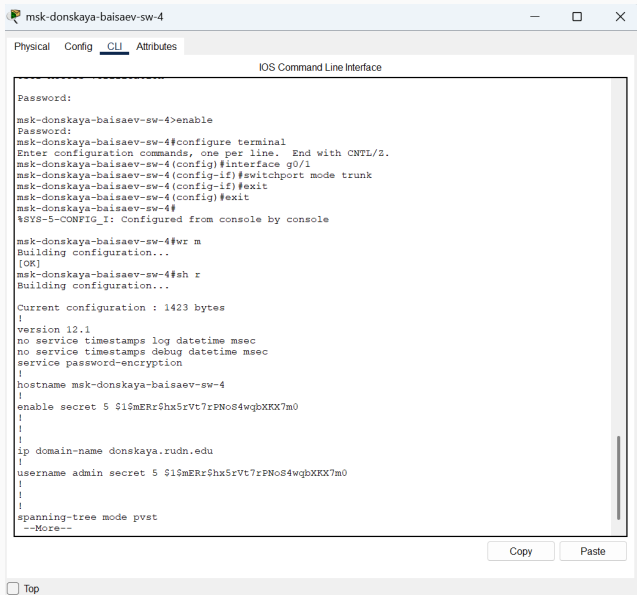
msk-donskaya-baisaev-sw-3(config)#exit
msk-donskaya-baisaev-sw-3#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-baisaev-sw-3#wr m
Building configuration...
[OK]
msk-donskaya-baisaev-sw-3#sh r
Building configuration...

Current configuration : 1423 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-baisaev-sw-3
!
enable secret 5 $1$mERr$hX5rVt7rPN0S4wqbXKX7m0
!
!
!
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1$mERr$hX5rVt7rPN0S4wqbXKX7m0
!
!
spanning-tree mode pvst
--More--
```

At the bottom of the CLI window, there are 'Copy' and 'Paste' buttons. Below the CLI window, there is a 'Top' button with a checkbox next to it.

Настройка Trunk-портов



```
msk-donskaya-baisaev-sw-4
Physical Config CLI Attributes

IOS Command Line Interface

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

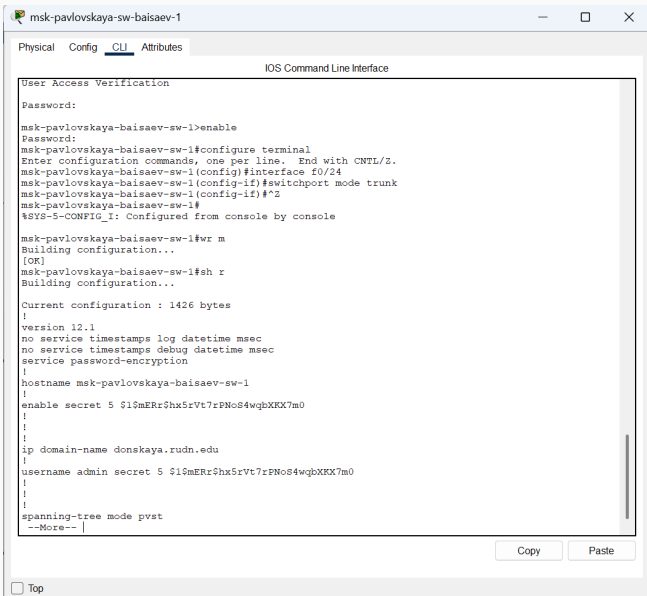
msk-donskaya-baisaev-sw-4#wr m
Building configuration...
[OK]
msk-donskaya-baisaev-sw-4#sh r
Building configuration...

Current configuration : 1423 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-baisaev-sw-4
!
enable secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
!
spanning-tree mode pvst
--More--
```

Copy Paste

☐ Top

Настройка Trunk-портов



```
msk-pavlovskaya-sw-baisaev-1
Physical Config CLI Attributes
IOS Command Line Interface

User Access Verification
Password:
msk-pavlovskaya-baisaev-sw-1>enable
Password:
msk-pavlovskaya-baisaev-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-pavlovskaya-baisaev-sw-1(config)#interface f0/24
msk-pavlovskaya-baisaev-sw-1(config-if)#switchport mode trunk
msk-pavlovskaya-baisaev-sw-1(config-if)#^Z
msk-pavlovskaya-baisaev-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-pavlovskaya-baisaev-sw-1#wr m
Building configuration...
[OK]
msk-pavlovskaya-baisaev-sw-1#sh r
Building configuration...

Current configuration : 1426 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-pavlovskaya-baisaev-sw-1
!
enable secret 5 $1$mERr$hX5rVt7rPNoS4wqbXKX7m0
!
!
!
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1$mERr$hX5rVt7rPNoS4wqbXKX7m0
!
!
!
spanning-tree mode pvst
--More--
```

☐ Top

Настройка Trunk-портов

```
msk-donskaya-baisaev-sw-1
Physical Config CLI Attributes
IOS Command Line Interface

msk-donskaya-baisaev-sw-1>enable
Password:
msk-donskaya-baisaev-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-baisaev-sw-1(config)#vtp mode server
Device mode already VTP SERVER.
msk-donskaya-baisaev-sw-1(config)#vtp domain donskaya
Changing VTP domain name from NULL to donskaya
msk-donskaya-baisaev-sw-1(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-donskaya-baisaev-sw-1(config)#vlan 2
msk-donskaya-baisaev-sw-1(config-vlan)#
VLAN2-5-CHANGED: Interface Vlan2, changed state to up

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

msk-donskaya-baisaev-sw-1(config-vlan)#name management
msk-donskaya-baisaev-sw-1(config-vlan)#vlan 3
msk-donskaya-baisaev-sw-1(config-vlan)#name servers
msk-donskaya-baisaev-sw-1(config-vlan)#vlan 101
msk-donskaya-baisaev-sw-1(config-vlan)#name dk
msk-donskaya-baisaev-sw-1(config-vlan)#vlan 102
msk-donskaya-baisaev-sw-1(config-vlan)#name departments
msk-donskaya-baisaev-sw-1(config-vlan)#vlan 103
msk-donskaya-baisaev-sw-1(config-vlan)#name adm
msk-donskaya-baisaev-sw-1(config-vlan)#vlan 104
msk-donskaya-baisaev-sw-1(config-vlan)#name other
msk-donskaya-baisaev-sw-1(config-vlan)#^
msk-donskaya-baisaev-sw-1#
SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-baisaev-sw-1#wr n
Building configuration...
[OK]
msk-donskaya-baisaev-sw-1#sh v
% Ambiguous command: "sh v"
msk-donskaya-baisaev-sw-1#sh vlan

VLAN Name                Status    Ports
-----
1    default                active    Fa0/4, Fa0/5, Fa0/6, Fa0/7
                                           Fa0/8, Fa0/9, Fa0/10, Fa0/11
                                           Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                           Fa0/16, Fa0/17, Fa0/18, Fa0/19
                                           Fa0/20, Fa0/21, Fa0/22, Fa0/23
                                           Fa0/24, Gig0/1, Gig0/2
2    management            active
3    servers                active
101   dk                     active
102   departments            active
103   adm                     active
104   other                  active
1002  fddi1-default          active
1003  token-ring-default    active
1004  fddinet-default       active
1005  trnet-default         active

VLAN Type  SAID      MTU    Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
-----
--More--
```

Настройка Trunk-портов

```
msk-donskaya-baisaev-sw-2
Physical Config CLI Attributes
IOS Command Line Interface

msk-donskaya-baisaev-sw-2#enable
Password:
msk-donskaya-baisaev-sw-2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-baisaev-sw-2(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-baisaev-sw-2(config)#interface range f0/1 - 2
msk-donskaya-baisaev-sw-2(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-2(config-if-range)%%SPANTREE-2-RECV_EVID_ERR: Received 802.1Q BPDU on
non trunk FastEthernet0/1 VLAN1.

%%SPANTREE-2-BLOCK_EVID_LOCAL: Blocking FastEthernet0/1 on VLAN0001. Inconsistent port type.

msk-donskaya-baisaev-sw-2(config-if-range)#interface range f0/1 - 2msk-donskaya-baisaev-
sw-2(config-if-range)#
msk-donskaya-baisaev-sw-2(config-if-range)#exit
msk-donskaya-baisaev-sw-2(config)#interface FastEthernet0/1
msk-donskaya-baisaev-sw-2(config-if)#interface range f0/2 - 2
msk-donskaya-baisaev-sw-2(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-2(config-if-range)#interface range f0/3 - 2
msk-donskaya-baisaev-sw-2(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-2(config-if-range)#interface range f0/1 - 2
msk-donskaya-baisaev-sw-2(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-2(config-if-range)#switchport access vlan 101
msk-donskaya-baisaev-sw-2(config-if-range)#switchport access vlan 101
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/2 (101), with msk-
donskaya-baisaev-sw-3 FastEthernet0/3 (1).
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (101), with msk-
donskaya-baisaev-sw-1 FastEthernet0/2 (1).
msk-donskaya-baisaev-sw-2(config-if-range)#switchport access vlan 3
msk-donskaya-baisaev-sw-2(config-if-range)#^Z
msk-donskaya-baisaev-sw-2#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-baisaev-sw-2#wr m
Building configuration...
[OK]
msk-donskaya-baisaev-sw-2#sh r
Building configuration...

Current configuration : 1570 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-baisaev-sw-2
!
enable secret 5 $1$mEr$hx5rVt7rPNoS4wqbKXK7m0
!
!
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1$mEr$hx5rVt7rPNoS4wqbKXK7m0
!
!
spanning-tree mode pvst
--More--
```

Настройка Trunk-портов

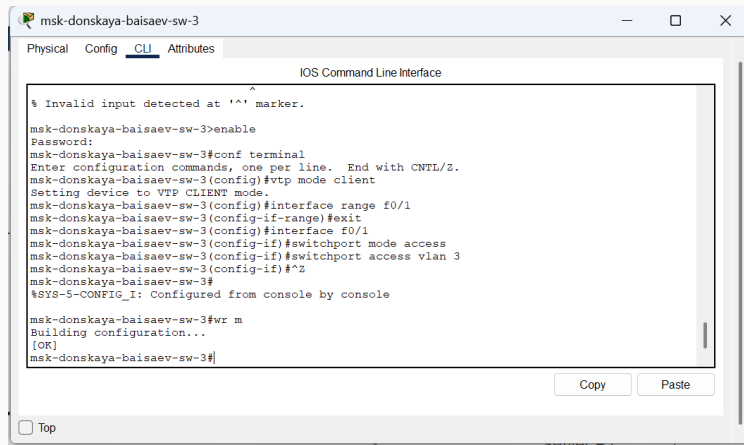


Figure 9: Настройка коммутатора msk-donskaya-baisaev-sw-3 как VTP-клиента и указание принадлежности к VLAN.

Настройка Trunk-портов

```
msk-donskaya-baisaev-sw-4
Physical Config CLI Attributes
IOS Command Line Interface

Password:
msk-donskaya-baisaev-sw-4>enable
Password:
msk-donskaya-baisaev-sw-4#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-baisaev-sw-4(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-baisaev-sw-4(config)#interface range f0/1 - 5
msk-donskaya-baisaev-sw-4(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#%SPANTREE-2-RECV_FVID_ERR: Received 802.1Q BPDU on non trunk FastEthernet0/1
VLAN1.

%SPANTREE-2-BLOCK_FVID_LOCAL: Blocking FastEthernet0/1 on VLAN0001. Inconsistent port type.

msk-donskaya-baisaev-sw-4(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#switchport access vlan 101
msk-donskaya-baisaev-sw-4(config-if-range)#interface range f0/6 - 10
msk-donskaya-baisaev-sw-4(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#switchport access vlan 102
msk-donskaya-baisaev-sw-4(config-if-range)#interface range f0/11 - 15
msk-donskaya-baisaev-sw-4(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/1 (101), with msk-donskaya-baisaev-sw-1
FastEthernet0/3 (1).
switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#switchport access vlan 103
msk-donskaya-baisaev-sw-4(config-if-range)#interface range f0/16 - 24
msk-donskaya-baisaev-sw-4(config-if-range)#switchport mode access
msk-donskaya-baisaev-sw-4(config-if-range)#switchport access vlan 104
msk-donskaya-baisaev-sw-4(config-if-range)#2
msk-donskaya-baisaev-sw-4#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-baisaev-sw-4#wr m
Building configuration...
[OK]
msk-donskaya-baisaev-sw-4#sh c
Building configuration...

Current configuration : 2671 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-baisaev-sw-4
!
enable secret 5 $1$mERr$hx5v7r7rPw0S4wqbXKX7m0
!
!
!
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1$mERr$hx5v7r7rPw0S4wqbXKX7m0
!
!
spanning-tree mode pvst
--More--
```

Настройка Trunk-портов

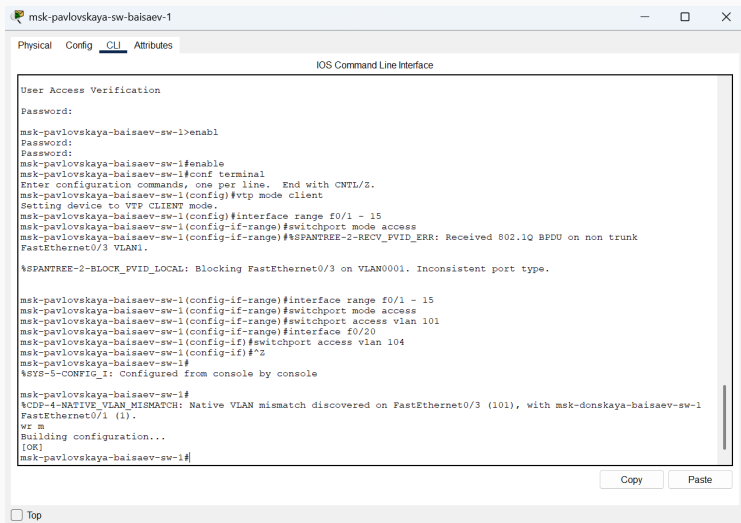


Figure 11: Настройка коммутатора msk-pavlovskaya-baisaev-sw-1 как VTP-клиента и указание принадлежности к VLAN

Указание статических IP-адресов

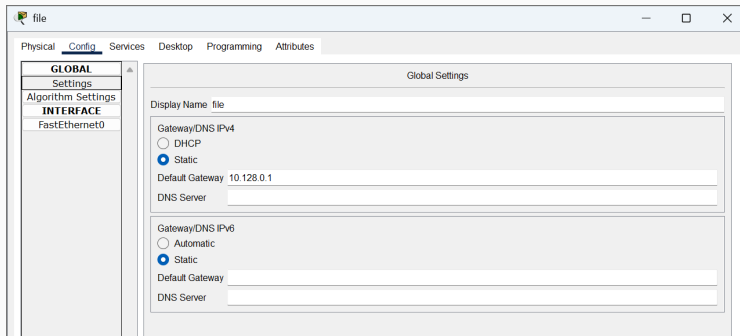


Figure 12: Пример указания статического IP-адреса на оконечном устройстве (Default Gateway).

Указание статических IP-адресов

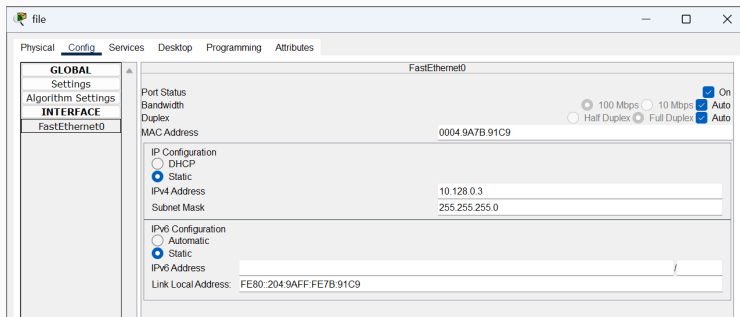
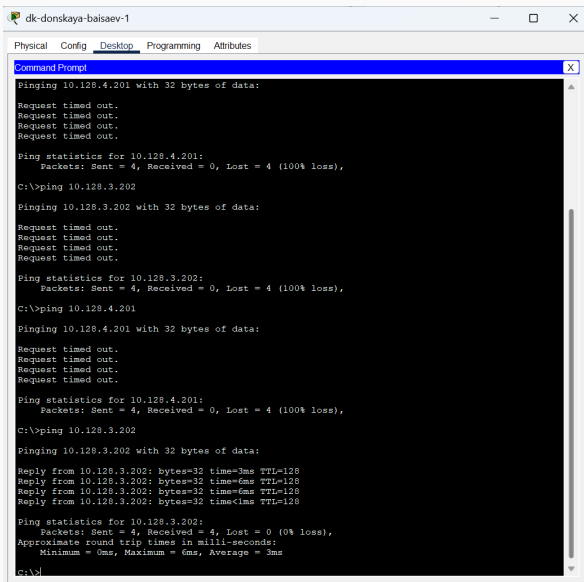


Figure 13: Проверка доступности устройств, принадлежащих одному VLAN, и недоступность устройств, принадлежащих разным VLAN.

Ping (доступность/недоступность)



```
dk-donskaya-balsaev-1
Physical Config Desktop Programming Attributes
Command Prompt
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 10.128.3.202
Pinging 10.128.3.202 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 10.128.3.202:
    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.
Request timed out.
Ping statistics for 10.128.4.201:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

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=3ms TTL=128
Reply from 10.128.3.202: bytes=32 time=6ms TTL=128
Reply from 10.128.3.202: bytes=32 time=6ms 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 = 6ms, Average = 3ms

C:\>
```


Режим симуляции в Packet Tracer, пакет ICMP

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	4.117	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	4.147	--	msk-donskaya-baisaev-sw-1	STP
	4.148	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	4.159	--	msk-donskaya-baisaev-sw-2	STP
	4.160	msk-donskaya-baisaev-sw-2	file	STP
	4.160	msk-donskaya-baisaev-sw-2	web	STP
	4.160	--	msk-donskaya-baisaev-sw-2	STP
	4.161	msk-donskaya-baisaev-sw-2	web	STP
	4.684	--	msk-donskaya-baisaev-sw-1	STP
	4.685	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	4.740	--	msk-donskaya-baisaev-sw-1	STP
	4.741	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	5.905	--	msk-donskaya-baisaev-sw-1	STP
	5.906	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	5.921	--	msk-donskaya-baisaev-sw-3	STP
	5.922	msk-donskaya-baisaev-sw-3	msk-donskaya-baisaev-sw-2	STP
	5.922	--	msk-donskaya-baisaev-sw-1	STP
	5.923	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	5.954	--	msk-donskaya-baisaev-sw-1	STP
	5.955	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	5.955	msk-donskaya-baisaev-sw-1	msk-donskaya-baisaev-sw-2	STP
	5.955	msk-donskaya-baisaev-sw-1	msk-donskaya-baisaev-sw-4	STP
	5.955	--	msk-donskaya-baisaev-sw-1	STP
	5.956	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	6.117	--	msk-donskaya-baisaev-sw-1	STP
	6.118	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	6.145	--	msk-donskaya-baisaev-sw-1	STP
	6.146	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP
	6.160	--	msk-donskaya-baisaev-sw-2	STP
	6.161	msk-donskaya-baisaev-sw-2	file	STP
	6.161	msk-donskaya-baisaev-sw-2	web	STP
	6.161	--	msk-donskaya-baisaev-sw-2	STP
	6.162	msk-donskaya-baisaev-sw-2	web	STP
	6.684	--	msk-donskaya-baisaev-sw-1	STP
	6.685	msk-donskaya-baisaev-sw-1	msk-pavlovskaya-sw-baisaev-1	STP

В ходе выполнения лабораторной работы мы получили основные навыки по настройке VLAN на коммутаторах сети.