

# Лабораторная работа № 5

## Конфигурирование VLAN

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## Цель работы

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Получить основные навыки по настройке VLAN на коммутаторах сети.

## Задание

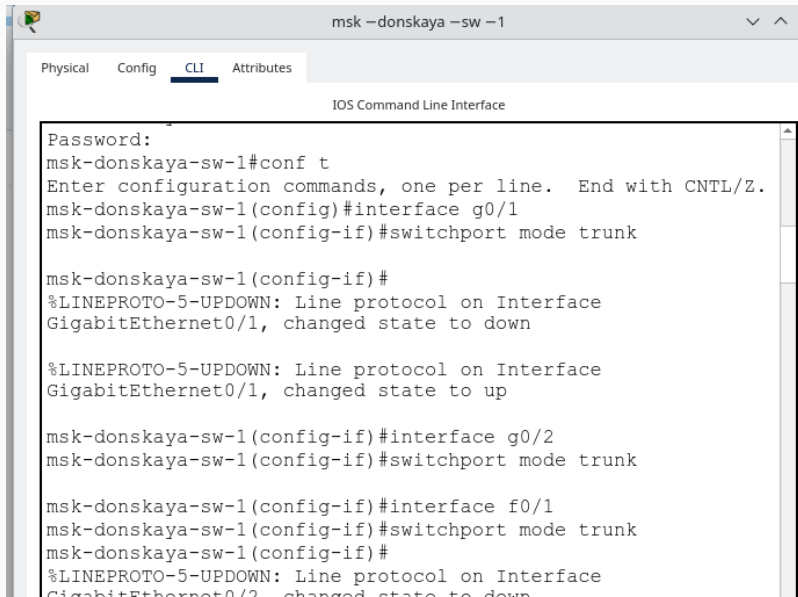
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1. На коммутаторах сети настроить Trunk-порты на соответствующих интерфейсах (см. табл. 3.2 из раздела 3.3), связывающих коммутаторы между собой.
2. Коммутатор msk-donskaya-sw-1 настроить как VTP-сервер и прописать на нём номера и названия VLAN согласно табл. 3.1 из раздела 3.3.
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 (см. табл. 3.3 из раздела 3.3).
4. На серверах прописать IP-адреса, как указано в табл. 3.2 из раздела 3.3.
5. На оконечных устройствах указать соответствующий адрес шлюза и прописать статические IP-адреса из диапазона соответствующей сети, следуя регламенту выделения ip-адресов (см. табл. 3.4 из раздела 3.3).
6. Проверить доступность устройств, принадлежащих одному VLAN, и недоступность устройств, принадлежащих разным VLAN.
7. При выполнении работы необходимо учитывать соглашение об именовании.

# **Выполнение лабораторной работы**

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# Конфигурация Trunk-порта



The screenshot shows a terminal window titled "msk -donskaya -sw -1". It has tabs for "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tabs, it says "IOS Command Line Interface". The terminal output shows the following commands and responses:

```
msk-donskaya-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-sw-1(config)#interface g0/1
msk-donskaya-sw-1(config-if)#switchport mode trunk

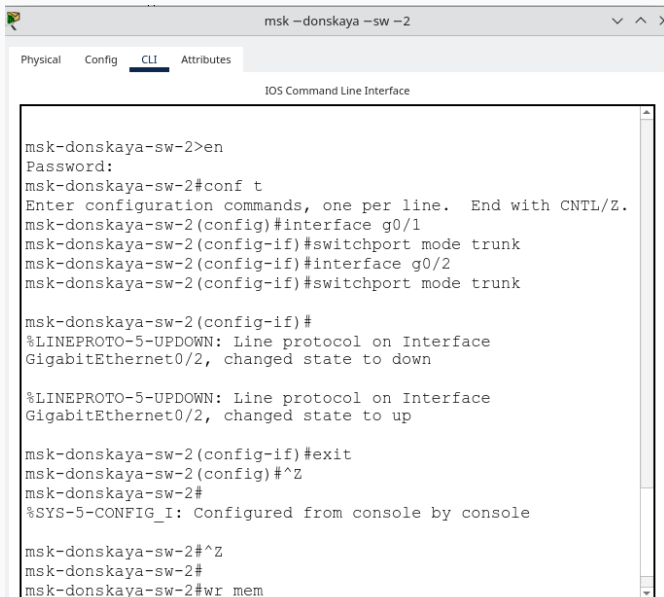
msk-donskaya-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/1, changed state to down

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

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

msk-donskaya-sw-1(config-if)#interface f0/1
msk-donskaya-sw-1(config-if)#switchport mode trunk
msk-donskaya-sw-1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/2, changed state to down
```

# Конфигурация Trunk-порта

The image shows a screenshot of a network switch's command-line interface (CLI) window. The window title is "msk -donskaya -sw -2". At the top, there are tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" being the active tab. Below the tabs, the text "IOS Command Line Interface" is displayed. The main area of the window contains a text-based conversation between a user and the switch. The user enters commands to enable the console, enter configuration mode, configure interfaces g0/1 and g0/2 as trunk ports, and then exits. The switch responds with prompts for password, confirmation to enter configuration mode, and status messages for the line protocol on the configured interfaces. Finally, the user saves the configuration and returns to the privileged EXEC mode.

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

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

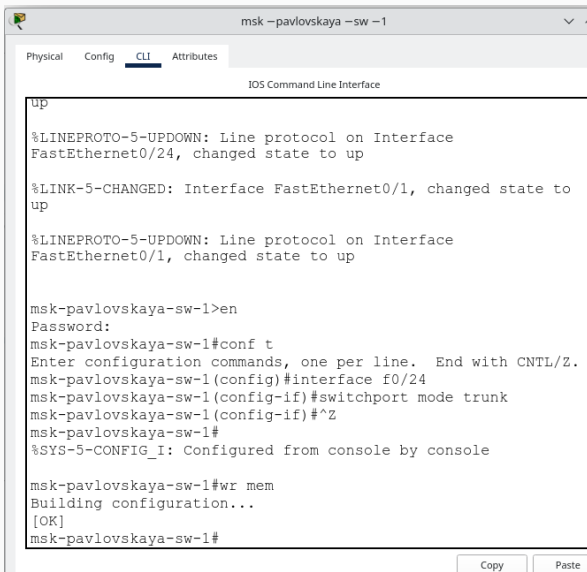
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/2, changed state to up

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

msk-donskaya-sw-2#^Z
msk-donskaya-sw-2#
msk-donskaya-sw-2#wr mem
```



# Конфигурация Trunk-порта



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

up

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

%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to
up

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

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

msk-pavlovskaya-sw-1#wr mem
Building configuration...
[OK]
msk-pavlovskaya-sw-1#
```

# Конфигурация VLAN

```
msk-donskaya-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-sw-1(config-vlan)#^Z
msk-donskaya-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-sw-1#sh vlan
```

VLAN	Name	Status	Ports
1	default	active	Fa0/2, Fa0/3, 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
2	management	active	
3	servers	active	
101	dk	active	
102	departments	active	
103	adm	active	
104	other	active	
1002	fddi-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--
```

# Конфигурация VLAN

msk -donskaya -sw -2

Physical Config **CLI** Attributes

IOS Command Line Interface

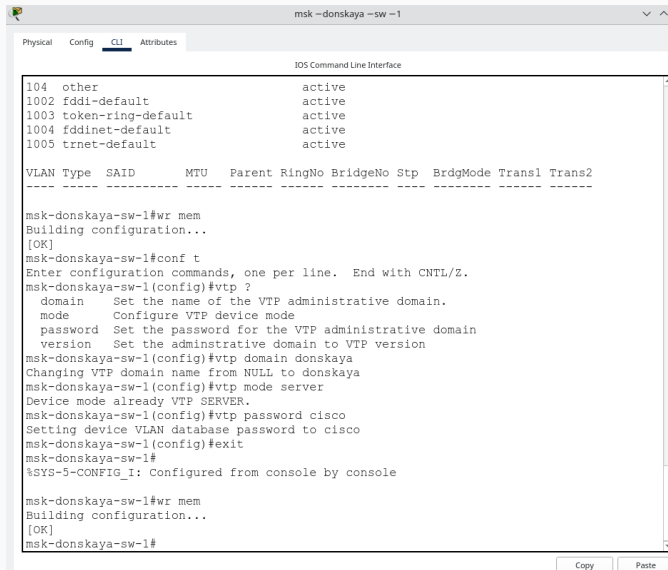
```
Fa0/9, Fa0/10
Fa0/12, Fa0/13, Fa0/14
Fa0/16, Fa0/17, Fa0/18
Fa0/20, Fa0/21, Fa0/22
Fa0/24
2    management      active
3    servers         active
101  dk              active
102  departments     active
103  adm             active
104  other           active
1002 fddi-default    active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default    active

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

Copy Paste

Top

# Конфигурация VTP



The screenshot shows a Cisco IOS CLI window titled "msk -donskaya -sw -1". The window has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The main content area displays the following commands and output:

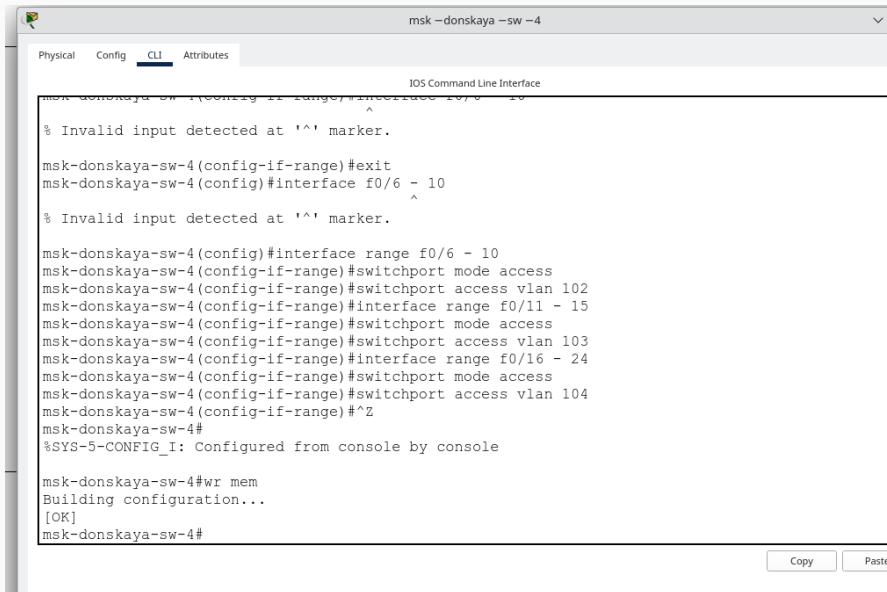
```
104 other active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2
-----
msk-donskaya-sw-1#wr mem
Building configuration...
[OK]
msk-donskaya-sw-1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-sw-1(config)#vtp ?
    domain    Set the name of the VTP administrative domain.
    mode       Configure VTP device mode
    password   Set the password for the VTP administrative domain
    version    Set the administrative domain to VTP version
msk-donskaya-sw-1(config)#vtp domain dontskaya
Changing VTP domain name from NULL to dontskaya
msk-donskaya-sw-1(config)#vtp mode server
Device mode already VTP SERVER.
msk-donskaya-sw-1(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-donskaya-sw-1(config)#exit
msk-donskaya-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-sw-1#wr mem
Building configuration...
[OK]
msk-donskaya-sw-1#
```

At the bottom right of the window, there are "Copy" and "Paste" buttons.

# Конфигурация диапазона портов



The screenshot shows a web-based configuration interface for a switch named 'msk-donskaya-sw-4'. The 'CLI' tab is selected under the 'Config' section. The interface displays the 'IOS Command Line Interface' with a series of commands and their outputs. The commands configure two interface ranges: f0/6-10 and f0/11-15, both set to access mode with VLANs 102 and 103 respectively. The configuration is saved to memory, and the process is confirmed with an '[OK]' message.

```
msk-donskaya-sw-4(config-if-range)#interface f0/6 - 10
^
% Invalid input detected at '^' marker.

msk-donskaya-sw-4(config-if-range)#exit
msk-donskaya-sw-4(config)#interface f0/6 - 10
^
% Invalid input detected at '^' marker.

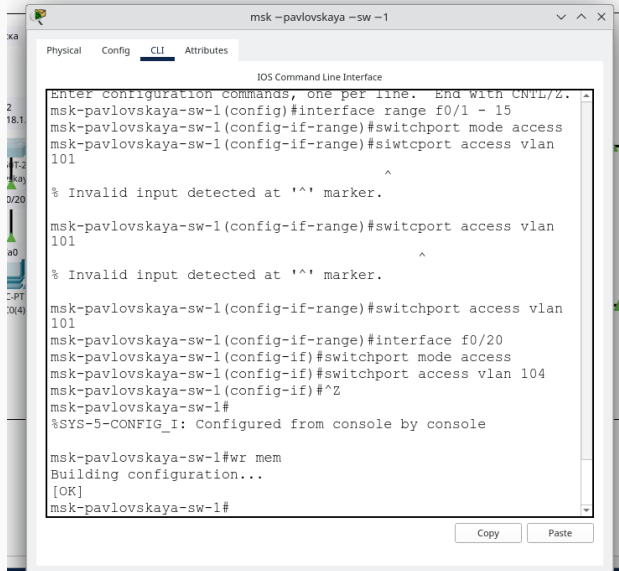
msk-donskaya-sw-4(config)#interface range f0/6 - 10
msk-donskaya-sw-4(config-if-range)#switchport mode access
msk-donskaya-sw-4(config-if-range)#switchport access vlan 102
msk-donskaya-sw-4(config-if-range)#interface range f0/11 - 15
msk-donskaya-sw-4(config-if-range)#switchport mode access
msk-donskaya-sw-4(config-if-range)#switchport access vlan 103
msk-donskaya-sw-4(config-if-range)#interface range f0/16 - 24
msk-donskaya-sw-4(config-if-range)#switchport mode access
msk-donskaya-sw-4(config-if-range)#switchport access vlan 104
msk-donskaya-sw-4(config-if-range)#^Z
msk-donskaya-sw-4#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-sw-4#wr mem
Building configuration...
[OK]
msk-donskaya-sw-4#
```

Copy

Paste

# Конфигурация диапазона портов



The screenshot shows a network configuration window titled "msk-pavlovskaya-sw-1". It has tabs for "Physical", "Config", "CLI", and "Attributes", with "CLI" selected. The window displays the "IOS Command Line Interface" with a series of commands and their outputs. The commands configure a range of interfaces (f0/1 - 15) and a specific interface (f0/20) as access ports for VLAN 101 and 104. The output shows the configuration being applied and the system being configured from the console.

```
msk-pavlovskaya-sw-1 (config)#interface range f0/1 - 15
msk-pavlovskaya-sw-1 (config-if-range)#switchport mode access
msk-pavlovskaya-sw-1 (config-if-range)#switchport access vlan 101
^
% Invalid input detected at '^' marker.

msk-pavlovskaya-sw-1 (config-if-range)#switchport access vlan 101
^
% Invalid input detected at '^' marker.

msk-pavlovskaya-sw-1 (config-if-range)#switchport access vlan 101
msk-pavlovskaya-sw-1 (config-if-range)#interface f0/20
msk-pavlovskaya-sw-1 (config-if)#switchport mode access
msk-pavlovskaya-sw-1 (config-if)#switchport access vlan 104
msk-pavlovskaya-sw-1 (config-if)#^Z
msk-pavlovskaya-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-pavlovskaya-sw-1#wr mem
Building configuration...
[OK]
msk-pavlovskaya-sw-1#
```

# Тестирование с помощью ping

**Simulation Panel**

**Event List**

Vis.	Time(sec)	Last Device
	0.000	--
	0.006	--
	0.007	Server0
	0.008	msk -donskaya -sw -3
	0.009	msk -donskaya -sw -2
	0.010	Server0(2)
	0.011	msk -donskaya -sw -2
	0.012	msk -donskaya -sw -3

**Simulation Controls**

Reset Simulation ☒ Constant Delay Captured 0.01

**Play Controls**

Event List Filters - Visible Events  
ICMP

Edit Filters Show All/None

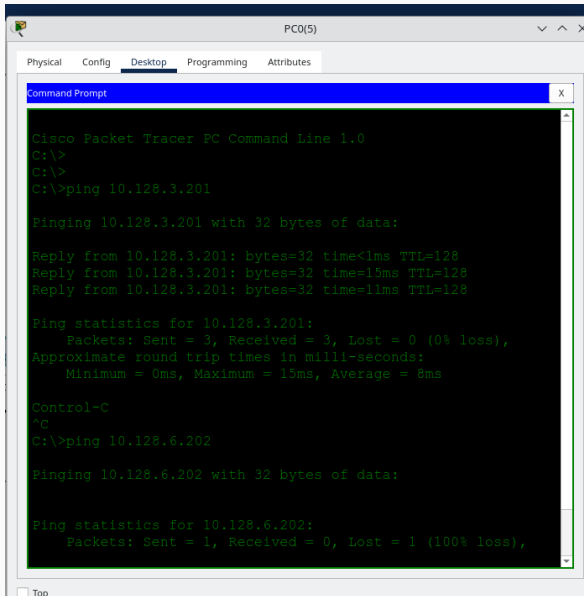
**Simulation Panel**

Event List Realtime Simulate

**Scenario 0**

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Serv...	Server0(2)	ICMP		0.000	N	0	(edit)	(delete)

# Тестирование с помощью ping



The screenshot shows a Cisco Packet Tracer PC Command Line window for PC0(5). The window has tabs for Physical, Config, Desktop (selected), Programming, and Attributes. The Command Prompt shows the following text:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>
C:\>
C:\>ping 10.128.3.201

Pinging 10.128.3.201 with 32 bytes of data:

Reply from 10.128.3.201: bytes=32 time<1ms TTL=128
Reply from 10.128.3.201: bytes=32 time=15ms TTL=128
Reply from 10.128.3.201: bytes=32 time=11ms TTL=128

Ping statistics for 10.128.3.201:
    Packets: Sent = 3, Received = 3, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 15ms, Average = 8ms

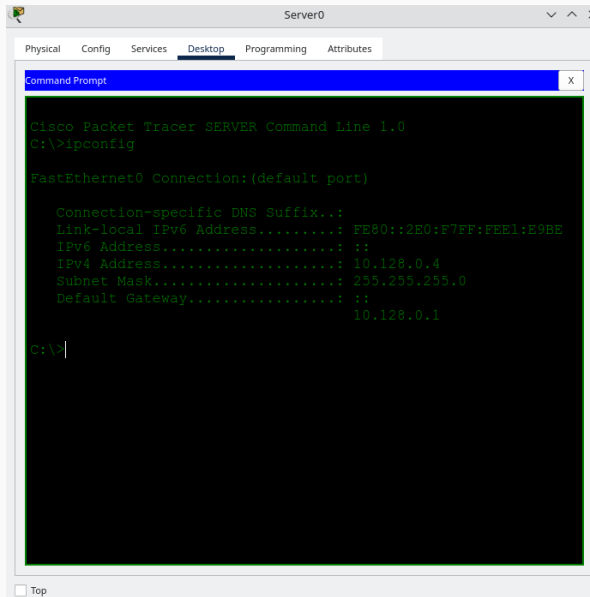
Control-C
^C
C:\>ping 10.128.6.202

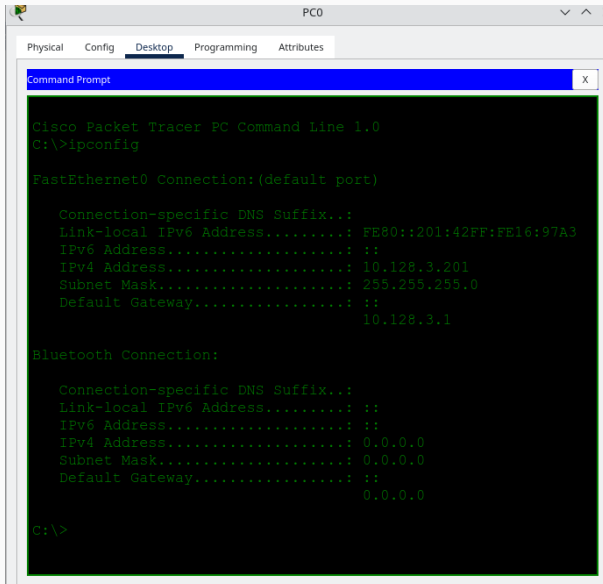
Pinging 10.128.6.202 with 32 bytes of data:

Ping statistics for 10.128.6.202:
    Packets: Sent = 1, Received = 0, Lost = 1 (100% loss),
```



# IP-адреса





```
PC0
Physical Config Desktop Programming Attributes
Command Prompt X

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

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: FE80::201:42FF:FE16:97A3
    IPv6 Address.....: ::
    IPv4 Address.....: 10.128.3.201
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: ::
                        10.128.3.1

Bluetooth Connection:

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

C:\>
```

## Выводы

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Научился настраивать VLAN в сети. Я также узнал о магистральных портах, портах доступа и VTP.