

Лабораторная работа №5

Конфигурирование VLAN

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Информация

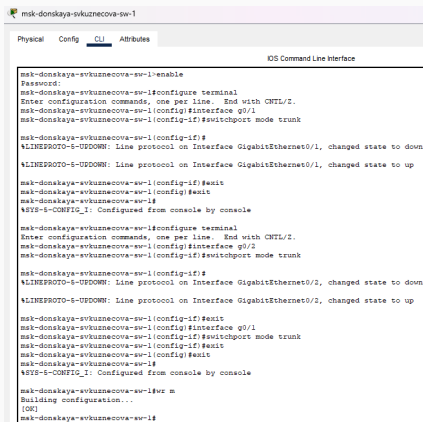
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- Российский университет дружбы народов

Ход работы



Рис. 1: Открытие проекта lab_PT-05.pkt

Настройка Trunk-порта.



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

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

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

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

msk-donskaya-svkuznecova-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-svkuznecova-sw-1(config-if)#exit
msk-donskaya-svkuznecova-sw-1(config)#interface g0/1
msk-donskaya-svkuznecova-sw-1(config-if)#switchport mode trunk
msk-donskaya-svkuznecova-sw-1(config-if)#exit
msk-donskaya-svkuznecova-sw-1(config)#exit
msk-donskaya-svkuznecova-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

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

Рис. 2: Настройка Trunk-портов на коммутаторе msk-donskaya-svkuznecova-sw-1

Настройка Trunk-порта.



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

msk-donskaya-svkuznecova-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

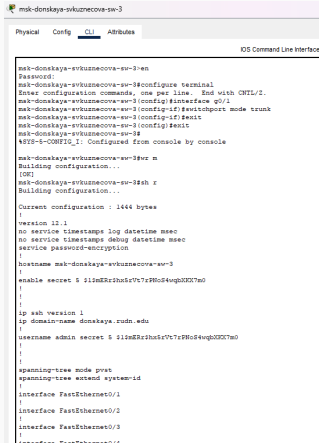
msk-donskaya-svkuznecova-sw-2(config-if)#exit
msk-donskaya-svkuznecova-sw-2(config)#exit
msk-donskaya-svkuznecova-sw-2#
MSR-8-CONFIG_1: Configured from console by console

msk-donskaya-svkuznecova-sw-2#wr m
Building configuration...
[OK]
msk-donskaya-svkuznecova-sw-2#sh c
Building configuration...

Current configuration : 1467 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-svkuznecova-sw-2
!
enable secret 5 $1mE2rth5rV7c7R0d4uq0X0C7m0
!
!
ip ssh version 1
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1mE2rth5rV7c7R0d4uq0X0C7m0
!
!
spanning-tree mode pwt
end
msk-donskaya-svkuznecova-sw-2#
```

Рис. 3: Настройка Trunk-портов на коммутаторе msk-donskaya-svkuznecova-sw-2

Настройка Trunk-порта.



```
msk-donskaya-svkuznecova-sw-3
Physical  Config  CLI  Attributes
IOS Command Line Interface

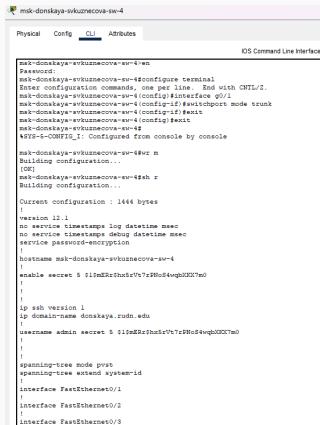
msk-donskaya-svkuznecova-sw-3>en
Password:
msk-donskaya-svkuznecova-sw-3#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-svkuznecova-sw-3(config)#interface g0/1
msk-donskaya-svkuznecova-sw-3(config-if)#switchport mode trunk
msk-donskaya-svkuznecova-sw-3(config-if)#exit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

msk-donskaya-svkuznecova-sw-3#wr m
Building configuration...
[OK]
msk-donskaya-svkuznecova-sw-3#sh c
Building configuration...

Current configuration : 1444 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-svkuznecova-sw-3
!
enable secret 5 $1$mRzrh5t7rPHo$4uqb30XK7m0
!
!
ip ssh version 1
ip domain-name dons kaya.rudn.edu
!
username admin secret 5 $1$mRzrh5t7rPHo$4uqb30XK7m0
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
!
interface FastEthernet0/4
```

Рис. 4: Настройка Trunk-портов на коммутаторе msk-donskaya-svkuznecova-sw-3

Настройка Trunk-порта.



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

msk-donskaya-svkuznecova-sw-4>en
Password:
msk-donskaya-svkuznecova-sw-4#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-svkuznecova-sw-4(config)#interface g0/1
msk-donskaya-svkuznecova-sw-4(config-if)#switchport mode trunk
msk-donskaya-svkuznecova-sw-4(config-if)#exit
msk-donskaya-svkuznecova-sw-4(config)#exit
msk-donskaya-svkuznecova-sw-4#
%SYS-6-CONFIG_1: Configured from console by console

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

Current configuration : 1444 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-svkuznecova-sw-4
!
enable secret 5 $1$mRz7hnt5tV7zPHo$4wqbXKX7m0
!
!
ip ssh version 1
ip domain-name donskeya.rudn.edu
!
username admin secret 5 $1$mRz7hnt5tV7zPHo$4wqbXKX7m0
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
!
interface FastEthernet0/2
!
interface FastEthernet0/3
```

Рис. 5: Настройка Trunk-портов на коммутаторе msk-donskaya-svkuznecova-sw-4

Настройка Trunk-порта.



Рис. 6: Настройка Trunk-портов на коммутаторе msk-pavlovskaya-svkuznecova-sw-1

```
msk-pavlovskaya-svkuznecova-sw-1(config)#interface f0/24
msk-pavlovskaya-svkuznecova-sw-1(config-if)#switchport mode trunk
msk-pavlovskaya-svkuznecova-sw-1(config-if)#exit
msk-pavlovskaya-svkuznecova-sw-1(config)#exit
msk-pavlovskaya-svkuznecova-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-pavlovskaya-svkuznecova-sw-1#wr
^
% Invalid input detected at '^' marker.

msk-pavlovskaya-svkuznecova-sw-1#sh c
Building configuration...

Current configuration : 1447 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-pavlovskaya-svkuznecova-sw-1
!
enable secret 5 $1$mRzhsrV7rP8oS4vqbXGX7m0
!
!
!
ip ssh version 1
ip domain-name donskaya.rudn.edu
!
username admin secret 5 $1$mRzhsrV7rP8oS4vqbXGX7m0
!
!
!
spanning-tree mode pwt
spanning-tree extend system-id
!
interface FastEthernet0/1
```

Рис. 7: Настройка Trunk-портов на коммутаторе msk-pavlovskaya-svkuznecova-sw-1

Настройка коммутатора как VTP-сервер и пропишем на нём номера и названия

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

Password:
Password:
msk-donskaya-svkuznecova-sw-1#en
Password:
msk-donskaya-svkuznecova-sw-1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-svkuznecova-sw-1(config)#vtp mode server
Device mode already VTP SERVER.
msk-donskaya-svkuznecova-sw-1(config)#vtp domain donskaya
Changing VTP domain name from NULL to donskaya
msk-donskaya-svkuznecova-sw-1(config)#vtp password cisco
Setting device VLAN database password to cisco
msk-donskaya-svkuznecova-sw-1(config)#vlan 3
msk-donskaya-svkuznecova-sw-1(config-vlan)#
%LINE-5-CHANGED: Interface Vlan3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan3, changed state to up

msk-donskaya-svkuznecova-sw-1(config-vlan)#name management
msk-donskaya-svkuznecova-sw-1(config-vlan)#vlan 3
msk-donskaya-svkuznecova-sw-1(config-vlan)#name servers
msk-donskaya-svkuznecova-sw-1(config-vlan)#vlan 101
msk-donskaya-svkuznecova-sw-1(config-vlan)#name db
msk-donskaya-svkuznecova-sw-1(config-vlan)#vlan 102
msk-donskaya-svkuznecova-sw-1(config-vlan)#name departments
msk-donskaya-svkuznecova-sw-1(config-vlan)#vlan 103
msk-donskaya-svkuznecova-sw-1(config-vlan)#name ade
msk-donskaya-svkuznecova-sw-1(config-vlan)#vlan 104
msk-donskaya-svkuznecova-sw-1(config-vlan)#name other
msk-donskaya-svkuznecova-sw-1(config-vlan)#exit
msk-donskaya-svkuznecova-sw-1(config)#exit
msk-donskaya-svkuznecova-sw-1#
VTP#-5-CONFIG_1: Configured from console by console

msk-donskaya-svkuznecova-sw-1#wr m
Building configuration...
[OK]
msk-donskaya-svkuznecova-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
3	management	active	
101	servers	active	
102	db	active	
103	departments	active	
104	ade	active	

Рис. 8: Настройка коммутатора msk-donskaya-svkuznecova-sw-1 как VTP-сервер добавление номера и название VLAN

Настройка коммутатора как VTP-клиенты и указание принадлежности к VLAN



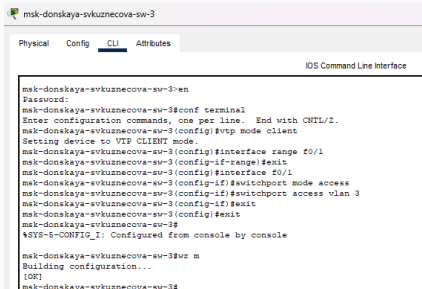
```
msk-donskaya-svkuznecova-sw-2
Physical Config CLI Attributes
IOS Command Line Interface
Password:
msk-donskaya-svkuznecova-sw-2>en
Password:
msk-donskaya-svkuznecova-sw-2#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-svkuznecova-sw-2(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-svkuznecova-sw-2(config)#interface range f0/1 - 2
msk-donskaya-svkuznecova-sw-2(config-if-range)#switchport mode access
msk-donskaya-svkuznecova-sw-2(config-if-range)#switchport access vlan 101
msk-donskaya-svkuznecova-sw-2(config-if-range)#switchport access vlan 101
msk-donskaya-svkuznecova-sw-2(config-if-range)#switchport access vlan 3
msk-donskaya-svkuznecova-sw-2(config-if-range)#exit
msk-donskaya-svkuznecova-sw-2(config)#exit
msk-donskaya-svkuznecova-sw-2#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-svkuznecova-sw-2#vr m
Building configuration...
[OK]
msk-donskaya-svkuznecova-sw-2#sh r
Building configuration...

Current configuration : 1567 bytes
!
version 12.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-svkuznecova-sw-2
!
enable secret 5 $1$mERr$hx5r7rPN0S4wqbXKX7m0
!
!
!
ip ssh version 1
ip domain-name donskeya.rudn.edu
```

Рис. 9: Настройка коммутатора msk-donskaya-svkuznecova-sw-2 как VTP-клиента и указание принадлежности к VLAN

Настройка коммутатора как VTP-клиенты и указание принадлежности к VLAN

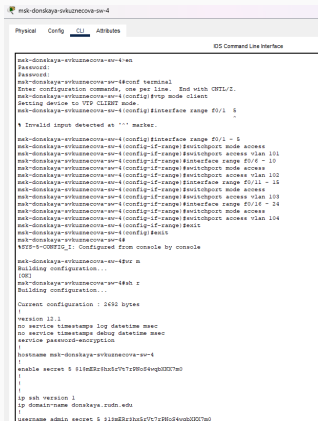


```
msk-donskaya-svkuznecova-sw-3>en
Password:
msk-donskaya-svkuznecova-sw-3#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-svkuznecova-sw-3(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-svkuznecova-sw-3(config)#interface range f0/1
msk-donskaya-svkuznecova-sw-3(config-if-range)#exit
msk-donskaya-svkuznecova-sw-3(config)#interface f0/1
msk-donskaya-svkuznecova-sw-3(config-if)#switchport mode access
msk-donskaya-svkuznecova-sw-3(config-if)#switchport access vlan 3
msk-donskaya-svkuznecova-sw-3(config-if)#exit
msk-donskaya-svkuznecova-sw-3(config)#exit
msk-donskaya-svkuznecova-sw-3#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-svkuznecova-sw-3#wr m
Building configuration...
[OK]
msk-donskaya-svkuznecova-sw-3#
```

Рис. 10: Настройка коммутатора msk-donskaya-svkuznecova-sw-3 как VTP-клиента и указание принадлежности к VLAN

Настройка коммутатора как VTP-клиенты и указание принадлежности к VLAN



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

msk-donskaya-svkuznesova-sw-4>en
Password:
Password:
msk-donskaya-svkuznesova-sw-4#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-donskaya-svkuznesova-sw-4(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-donskaya-svkuznesova-sw-4(config)#interface range f0/1 - 5
% Invalid input detected at '^' marker.

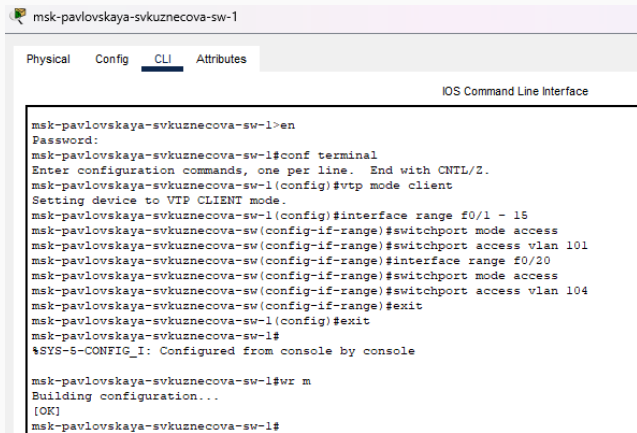
msk-donskaya-svkuznesova-sw-4(config)#interface range f0/1 - 5
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport mode access
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport access vlan 101
msk-donskaya-svkuznesova-sw-4(config-if-range)#interface range f0/6 - 10
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport mode access
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport access vlan 102
msk-donskaya-svkuznesova-sw-4(config-if-range)#interface range f0/11 - 15
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport mode access
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport access vlan 103
msk-donskaya-svkuznesova-sw-4(config-if-range)#interface range f0/16 - 24
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport mode access
msk-donskaya-svkuznesova-sw-4(config-if-range)#switchport access vlan 104
msk-donskaya-svkuznesova-sw-4(config-if-range)#exit
msk-donskaya-svkuznesova-sw-4(config)#exit
msk-donskaya-svkuznesova-sw-4#
VTPS>S-CFGID.1: Configured from console by console

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

Current configuration : 2692 bytes
!
version 13.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname msk-donskaya-svkuznesova-sw-4
!
enable secret 5 $1$mRzph5r7%7zPw0$4qgb0XK7m0
!
!
ip ssh version 1
ip domain-name donskeya.ru.dn.edu
!
username admin secret 5 $1$mRzph5r7%7zPw0$4qgb0XK7m0
```

Рис. 11: Настройка коммутатора msk-donskaya-svkuznesova-sw-4 как VTP-клиента и указание принадлежности к VLAN

Настройка коммутатора как VTP-клиенты и указание принадлежности к VLAN



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

msk-pavlovskaya-svkuznecova-sw-1>en
Password:
msk-pavlovskaya-svkuznecova-sw-1#conf terminal
Enter configuration commands, one per line. End with CNTL/Z.
msk-pavlovskaya-svkuznecova-sw-1(config)#vtp mode client
Setting device to VTP CLIENT mode.
msk-pavlovskaya-svkuznecova-sw-1(config)#interface range f0/1 - 15
msk-pavlovskaya-svkuznecova-sw-1(config-if-range)#switchport mode access
msk-pavlovskaya-svkuznecova-sw-1(config-if-range)#switchport access vlan 101
msk-pavlovskaya-svkuznecova-sw-1(config-if-range)#interface range f0/20
msk-pavlovskaya-svkuznecova-sw-1(config-if-range)#switchport mode access
msk-pavlovskaya-svkuznecova-sw-1(config-if-range)#switchport access vlan 104
msk-pavlovskaya-svkuznecova-sw-1(config-if-range)#exit
msk-pavlovskaya-svkuznecova-sw-1(config)#exit
msk-pavlovskaya-svkuznecova-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

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

Рис. 12: Настройка коммутатора msk-pavlovskaya-svkuznecova-sw-1 как VTP-клиента и указание принадлежности к VLAN

Статический IP-адрес на оконечных устройствах

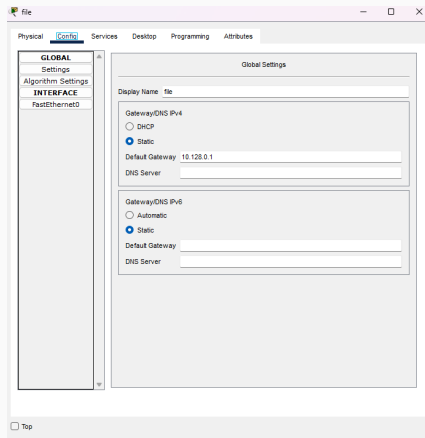


Рис. 13: Пример указания статического IP-адреса на оконечном устройстве(Default Gateway)

Статический IP-адрес на оконечных устройствах

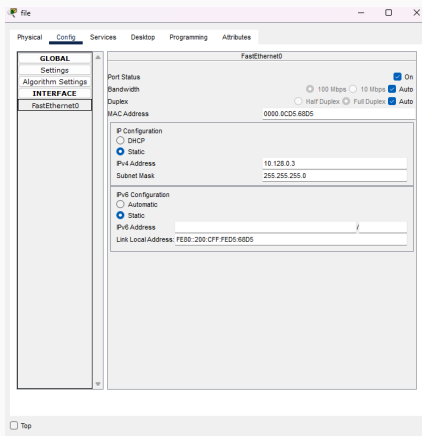


Рис. 14: Пример указания статического IP-адреса на оконечном устройстве(IP Configuration)

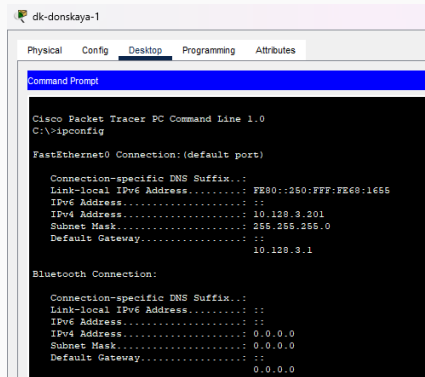


Рис. 15: Проверка доступности устройства Paket Tracer, принадлежащих одному VLAN, и недоступность устройств, принадлежащих разным VLAN

```
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=3ms TTL=128
Reply from 10.128.3.202: bytes=32 time=4ms TTL=128
Reply from 10.128.3.202: bytes=32 time=4ms 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 = 3ms, Maximum = 4ms, Average = 3ms

C:\>ping 10.128.3.204

Pinging 10.128.3.204 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 10.128.3.204:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

Рис. 16: Проверка доступности устройства Paket Tracer, принадлежащих одному VLAN, и недоступность устройств, принадлежащих разным VLAN

0.003	msk-donskaya-svkuznecova-sw-1	msk-donskaya-svkuznecova-sw-2	ARP
0.003	msk-donskaya-svkuznecova-sw-1	msk-donskaya-svkuznecova-sw-4	ARP
0.003	--	msk-donskaya-svkuznecova-sw-1	ARP
0.004	msk-donskaya-svkuznecova-sw-1	msk-donskaya-svkuznecova-sw-2	ARP
0.004	msk-donskaya-svkuznecova-sw-4	dk-donskaya-1	ARP
2.000	--	dep-donskaya-1	ICMP
2.000	--	dep-donskaya-1	ICMP
2.000	--	dep-donskaya-1	ICMP
2.000	--	dep-donskaya-1	ICMP
2.000	--	dep-donskaya-1	ICMP
2.003	--	dk-pavlovskaya-1	ICMP

Рис. 17: Изучение процесса передвижения пакета ICMP по сети и режиме симуляции Packet Tracer

При выполнении лабораторной работы были получены основные навыки по настройке VLAN на коммутаторах сети.

Спасибо за внимание!