Лабораторная работа №5

Конфигурирование VLAN

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Информация

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Цель работы

Получить основные навыки по настройке VLAN на коммутаторах сети.

Задание

1. На коммутаторах сети настроить Trunk-порты на соответствующих интерфейсах, связывающих коммутаторы между собой.
2. Коммутатор msc-donskaya-sw-1 настроить как VTP-сервер и прописать на нём номера и названия VLAN.
3. Коммутаторы msc-donskaya-sw-2 — msc-donskaya-sw-4, msc-pavlovskaya-sw-1 настроить как VTP-клиенты, на интерфейсах указать принадлежность к соответствующему VLAN.
4. На серверах прописать IP-адреса.

Задание

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

```
User Access Verification

Password:

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

msc-donskaya-shuvayev-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

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

msc-donskaya-shuvayev-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
```

Figure 1: Настройка Trunk-порта на msc-donskaya-shuvayev-sw-1

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

msc-donskaya-shuvayev-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
```

Figure 2: Настройка Trunk-порта на msc-donskaya-shuvayev-sw-2

```
msc-donskaya-shuvayev-sw-3#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#
msc-donskaya-shuvayev-sw-3#enable
msc-donskaya-shuvayev-sw-3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-3(config)#interface g0/1
msc-donskaya-shuvayev-sw-3(config-if)#switchport mode trunk
msc-donskaya-shuvayev-sw-3(config-if)#exit
msc-donskaya-shuvayev-sw-3(config)#exit
msc-donskaya-shuvayev-sw-3#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#
```

Figure 3: Настройка Trunk-порта на msc-donskaya-shuvayev-sw-3

Выполнение лабораторной работы

```
User Access Verification

Password:

msc-donskaya-shuvayev-sw-4>enable
Password:
msc-donskaya-shuvayev-sw-4#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-4(config)#interface g0/1
msc-donskaya-shuvayev-sw-4(config-if)#switchport mode trunk
msc-donskaya-shuvayev-sw-4(config-if)#exit
msc-donskaya-shuvayev-sw-4(config)#exit
msc-donskaya-shuvayev-sw-4#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-4#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-4#
```

Figure 4: Настройка Trunk-порта на msc-donskaya-shuvayev-sw-4

```
msc-donskaya-shuvayev-sw-1>enable
Password:
msc-donskaya-shuvayev-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-1(config)#interface f0/1
msc-donskaya-shuvayev-sw-1(config-if)#switchport mode trunk
                                     ^
% Invalid input detected at '^' marker.

msc-donskaya-shuvayev-sw-1(config-if)#switchport mode trunk
msc-donskaya-shuvayev-sw-1(config-if)#exit
msc-donskaya-shuvayev-sw-1(config)#exit
msc-donskaya-shuvayev-sw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-1#wr m
Building configuration...
[OK]
```

Figure 5: Настройка Trunk-порта на msc-donskaya-shuvayev-sw-1

```
msc-pavlovskaya-shuvayev-sw1>enable
Password:
msc-pavlovskaya-shuvayev-sw1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-pavlovskaya-shuvayev-sw1(config)#interface f0/24
msc-pavlovskaya-shuvayev-sw1(config-if)#switchport mode trunk
msc-pavlovskaya-shuvayev-sw1(config-if)#exit
msc-pavlovskaya-shuvayev-sw1(config)#exit
msc-pavlovskaya-shuvayev-sw1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-pavlovskaya-shuvayev-sw1#wr m
Building configuration...
[OK]
msc-pavlovskaya-shuvayev-sw1#
```

Figure 6: Настройка Trunk-порта на msc-pavlovskaya-shuvayev-sw-1

```
msc-donskaya-shuvayev-sw-1(config-vlan)#name management
msc-donskaya-shuvayev-sw-1(config-vlan)#vlan 3
msc-donskaya-shuvayev-sw-1(config-vlan)#name servers
msc-donskaya-shuvayev-sw-1(config-vlan)#vlan 101
msc-donskaya-shuvayev-sw-1(config-vlan)#name dk
msc-donskaya-shuvayev-sw-1(config-vlan)#vlan 102
msc-donskaya-shuvayev-sw-1(config-vlan)#name departaments
msc-donskaya-shuvayev-sw-1(config-vlan)#vlan 103
msc-donskaya-shuvayev-sw-1(config-vlan)#name adm
msc-donskaya-shuvayev-sw-1(config-vlan)#vlan 104
msc-donskaya-shuvayev-sw-1(config-vlan)#name other
msc-donskaya-shuvayev-sw-1(config-vlan)#exit
msc-donskaya-shuvayev-sw-1(config)#exit
msc-donskaya-shuvayev-sw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-1#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-1#
```

Figure 7: Задания VLAN

```
msc-donskaya-shuvayev-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  departaments                      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--
```

Figure 8: Команда show vlan

```
msc-donskaya-shuvayev-sw-1(config)#vtp domain donskaya
Domain name already set to donskaya.
msc-donskaya-shuvayev-sw-1(config)#vtp mode server
Device mode already VTP SERVER.
msc-donskaya-shuvayev-sw-1(config)#vtp password cisco
Password already set to cisco
msc-donskaya-shuvayev-sw-1(config)#wr m
                                   ^
% Invalid input detected at '^' marker.

msc-donskaya-shuvayev-sw-1(config)#exit
msc-donskaya-shuvayev-sw-1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-1#
```

Figure 9: Конфигурация VTP msc-donskaya-shuvayev-sw-1

Выполнение лабораторной работы

```
msc-donskaya-shuvayev-sw-2>enable
Password:
msc-donskaya-shuvayev-sw-2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-2(config)#vtp domain donskaya
Domain name already set to donskaya.
msc-donskaya-shuvayev-sw-2(config)#vtp mode client
Setting device to VTP CLIENT mode.
msc-donskaya-shuvayev-sw-2(config)#vtp password cisco
Setting device VLAN database password to cisco
msc-donskaya-shuvayev-sw-2(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up
wr m
                                    ^
% Invalid input detected at '^' marker.

msc-donskaya-shuvayev-sw-2(config)#exit
msc-donskaya-shuvayev-sw-2#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-2#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-2#
```

Figure 10: Конфигурация VTP msc-donskaya-shuvayev-sw-2

Выполнение лабораторной работы

```
User Access Verification

Password:

msc-donskaya-shuvayev-sw-3>conf t
                           ^
% Invalid input detected at '^' marker.

msc-donskaya-shuvayev-sw-3>enable
Password:
msc-donskaya-shuvayev-sw-3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-3(config)#vtp mode client
Setting device to VTP CLIENT mode.
msc-donskaya-shuvayev-sw-3(config)#vtp password cisco
Setting device VLAN database password to cisco
msc-donskaya-shuvayev-sw-3(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up
wr m
                                   ^
% Invalid input detected at '^' marker.

msc-donskaya-shuvayev-sw-3(config)#exit
msc-donskaya-shuvayev-sw-3#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#
```

Выполнение лабораторной работы

```
User Access Verification

Password:

msc-donskaya-shuvayev-sw-4>enable
Password:
msc-donskaya-shuvayev-sw-4#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-4(config)#vtp mode client
Setting device to VTP CLIENT mode.
msc-donskaya-shuvayev-sw-4(config)#vtp password cisco
Setting device VLAN database password to cisco
msc-donskaya-shuvayev-sw-4(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to up
exit
msc-donskaya-shuvayev-sw-4#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-4#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-4#
```

Figure 12: Конфигурация VTP msc-donskaya-shuvayev-sw-4

```
msc-donskaya-shuvayev-sw-4>sh vtp status
VTP Version                     : 1
Configuration Revision          : 12
Maximum VLANs supported locally : 255
Number of existing VLANs        : 11
VTP Operating Mode              : Client
VTP Domain Name                 : donskaya
VTP Pruning Mode                : Disabled
VTP V2 Mode                     : Disabled
VTP Traps Generation            : Disabled
MD5 digest                      : 0xB0 0x9B 0x52 0xFA 0x17 0xC7 0xE3 0x7B
Configuration last modified by 10.128.1.2 at 3-1-93 00:55:45
msc-donskaya-shuvayev-sw-4>
```

Figure 13: vtp status

Выполнение лабораторной работы

```
msc-donskaya-shuvayev-sw-4>sh vlan

VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Fa0/2, Fa0/3, Fa0/4, Fa0/5
                                                Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                Fa0/12, Fa0/13, Fa0/14, Fa0/15
                                                Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                Gig0/2
2    management                       active
3    servers                          active
101  dk                               active
102  departaments                     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--
```

Figure 14: Проверка отображения VLAN

```
msc-pavlovskaya-shuvayev-sw1>enable
Password:
msc-pavlovskaya-shuvayev-sw1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-pavlovskaya-shuvayev-sw1(config)#vtp mode client
Setting device to VTP CLIENT mode.
msc-pavlovskaya-shuvayev-sw1(config)#vtp password cisco
Setting device VLAN database password to cisco
msc-pavlovskaya-shuvayev-sw1(config)#
%LINK-5-CHANGED: Interface Vlan2, changed state to up

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

msc-pavlovskaya-shuvayev-sw1(config)#exit
msc-pavlovskaya-shuvayev-sw1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-pavlovskaya-shuvayev-sw1#wr m
Building configuration...
[OK]
msc-pavlovskaya-shuvayev-sw1#
```

Figure 15: Конфигурация VTP msc-pavlovskaya-shuvayev-sw-1

Выполним эту конфигурацию в соответствии с таблицей:

Table 1: Таблица портов

Устройство	Порт	Примечание	Access VLAN	Trunk VLAN
msc-donskaya-shuvayev-gw-1	f0/1	UpLink		
	f0/0	msc-donskaya-sw-1		2, 3, 101, 102, 103, 104
msc-donskaya-shuvayev-sw-1	f0/24	msc-donskaya-gw-1		2, 3, 101, 102, 103, 104
	g0/1	msc-donskaya-sw-2		2, 3
	g0/2	msc-donskaya-		2, 101, 102, 103, 104

```
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport mode access
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport access vlan 101
msc-donskaya-shuvayev-sw-4(config-if-range)#interface range f0/6-10
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport mode access
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport access vlan 102
msc-donskaya-shuvayev-sw-4(config-if-range)#interface range f0/11-15
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport mode access
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport access vlan 103
msc-donskaya-shuvayev-sw-4(config-if-range)#interface range f0/16-24
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport mode access
msc-donskaya-shuvayev-sw-4(config-if-range)#
msc-donskaya-shuvayev-sw-4(config-if-range)#switchport access vlan 104
msc-donskaya-shuvayev-sw-4(config-if-range)#exit
msc-donskaya-shuvayev-sw-4(config)#wr m
                                   ^
% Invalid input detected at '^' marker.

msc-donskaya-shuvayev-sw-4(config)#exit
msc-donskaya-shuvayev-sw-4#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-4#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-4#
```

Figure 16: Конфигурация диапазона портов и указание принадлежности к VLAN для

Выполнение лабораторной работы

```
User Access Verification

Password:

msc-pavlovskaya-shuvayev-sw1>enable
Password:
msc-pavlovskaya-shuvayev-sw1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-pavlovskaya-shuvayev-sw1(config)#
msc-pavlovskaya-shuvayev-sw1(config)#interface range f0/1-15
msc-pavlovskaya-shuvayev-sw1(config-if-range)#switchport mode access
msc-pavlovskaya-shuvayev-sw1(config-if-range)#switchport access vlan 101
msc-pavlovskaya-shuvayev-sw1(config-if-range)#interface range f0/20
msc-pavlovskaya-shuvayev-sw1(config-if-range)#switchport mode access
msc-pavlovskaya-shuvayev-sw1(config-if-range)#switchport access vlan 104
msc-pavlovskaya-shuvayev-sw1(config-if-range)#exit
msc-pavlovskaya-shuvayev-sw1(config)#exit
msc-pavlovskaya-shuvayev-sw1#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-pavlovskaya-shuvayev-sw1#wr m
Building configuration...
[OK]
msc-pavlovskaya-shuvayev-sw1#
```

Figure 17: Конфигурация диапазона портов и указание принадлежности к VLAN для msc-pavlovskaya-shuvayev-sw-1

```
User Access Verification

Password:

msc-donskaya-shuvayev-sw-2>enable
Password:
msc-donskaya-shuvayev-sw-2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-2(config)#interface range f0/1 - 2
msc-donskaya-shuvayev-sw-2(config-if-range)#switchport mode acces
msc-donskaya-shuvayev-sw-2(config-if-range)#switchport acces vlan 3
msc-donskaya-shuvayev-sw-2(config-if-range)#exit
msc-donskaya-shuvayev-sw-2(config)#exit
msc-donskaya-shuvayev-sw-2#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-2#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-2#
```

Figure 18: Конфигурация диапазона портов и указание принадлежности к VLAN для msc-donskaya-shuvayev-sw-2

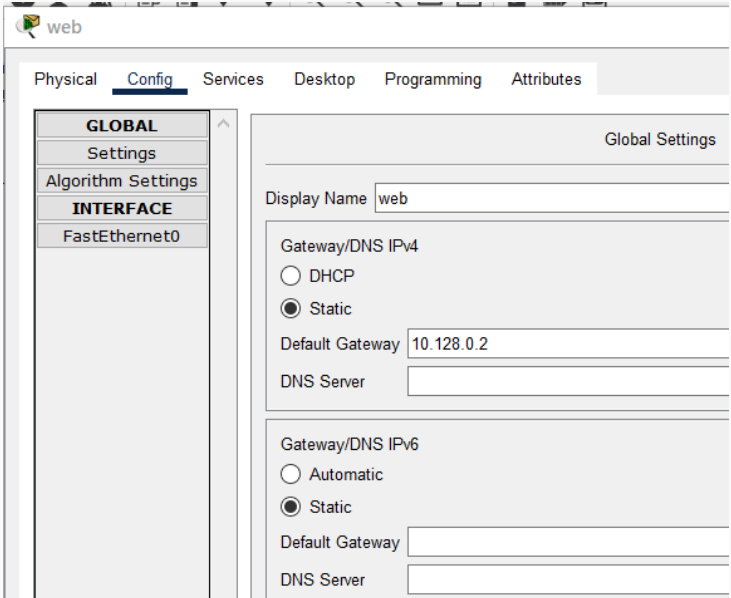
```
User Access Verification

Password:

msc-donskaya-shuvayev-sw-3>enable
Password:
msc-donskaya-shuvayev-sw-3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msc-donskaya-shuvayev-sw-3(config)#interface f0/1
msc-donskaya-shuvayev-sw-3(config-if)#switchport mode access
msc-donskaya-shuvayev-sw-3(config-if)#switchport access vlan 3
msc-donskaya-shuvayev-sw-3(config-if)#exit
msc-donskaya-shuvayev-sw-3(config)#exit
msc-donskaya-shuvayev-sw-3#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#wr m
Building configuration...
[OK]
msc-donskaya-shuvayev-sw-3#
```

Figure 19: Конфигурация диапазона портов и указание принадлежности к VLAN для msc-donskaya-shuvayev-sw-3

Задавать IP-адреса будем в соответствии с таблицей:

Table 2: Таблица IP. Сеть 10.128.0.0/16

IP-адреса	Примечание	VLAN
10.128.0.0/16	Вся сеть	
10.128.0.0/24	Серверная ферма	3
10.128.0.1	Шлюз	
10.128.0.2	Web	
10.128.0.3	File	


web
Physical
Config
Services
Desktop
Programming
Attributes
GLOBAL
Settings
Algorithm Settings
INTERFACE
FastEthernet0
Global Settings
Display Name
web
Gateway/DNS IPv4
DHCP
Static
Default Gateway
10.128.0.2
DNS Server
Gateway/DNS IPv6
Automatic
Static
Default Gateway
DNS Server

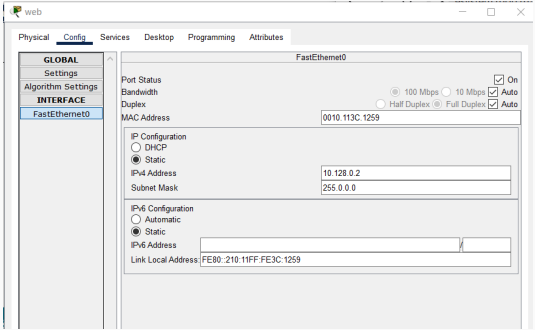


Figure 21: Задание IP-адреса

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

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::240:BFF:FED4:15BA
   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
```

Figure 22: ipconfig

Выполнение лабораторной работы

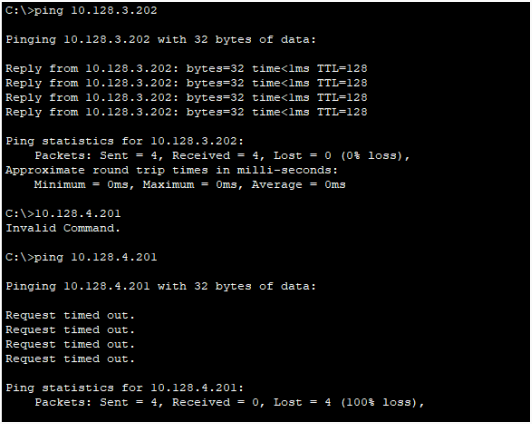


Figure 23: Пингование

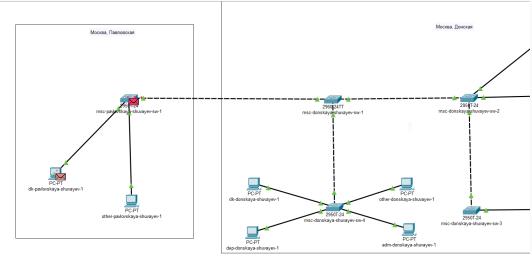


Figure 24: Режим симуляции

Выполнение лабораторной работы

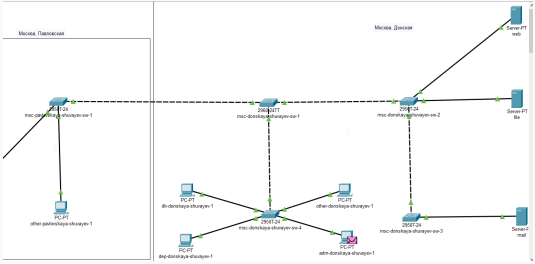


Figure 25: Режим симуляции

Выводы

В процессе выполнения данной лабораторной работы я получил основные навыки по настройке VLAN на коммутаторах сети.