ОТЧЁТ

Лабораторная работа №3

“Настройка виртуальной локальной сети (VLAN)“

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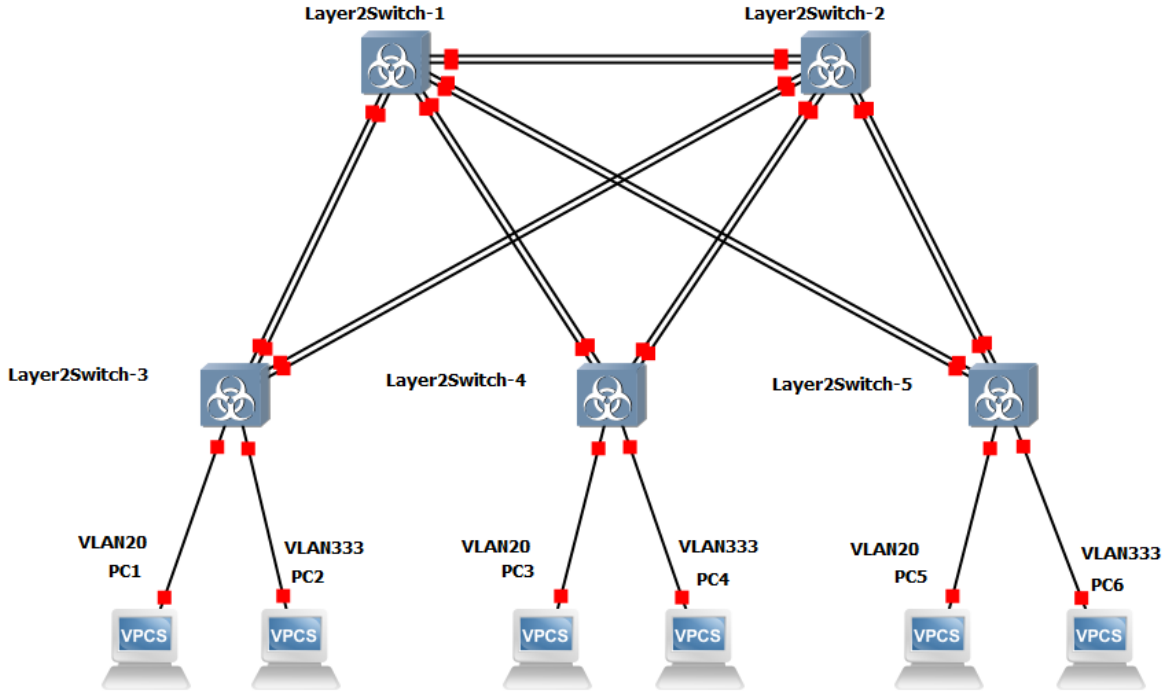
Ход работы

1. Для заданной на схеме schema-lab3 сети, состоящей из управляемых коммутаторов и персональных компьютеров настроить на коммутаторах логическую топологию используя протокол IEEE 802.1Q, для передачи пакетов VLAN333 между коммутаторами использовать Native VLAN.



Прописываем адреса у VPCS

ip 192.168.1.16 //16-21

save

Возникала ошибка из-за файла, пришлось удалить и создать заново

enable

delete flash:vlan.dat

reload

Вспомогательные команды

show cdp neighbors
configure terminal
vlan 20
name VLAN20
exit

vlan 333
name VLAN333
exit

```
end
wr
```

конфигурация портов на sw5

```
mac address-table
show interfaces
enable
configure terminal
interface Gi1/1
switchport access vlan 333
no shutdown
end
wr

configure terminal
interface Gi1/0
switchport access vlan 20
no shutdown
end
wr

configure terminal
interface Gi0/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr
copy running-config startup-config

configure terminal
interface Gi0/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
copy running-config startup-config
```

конфигурация SW2 к SW5

```
configure terminal
interface Gi1/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

copy running-config startup-config

конфигурация SW2

configure terminal
interface Gi1/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

конфигурация SW2 к SW4
Gig 1/0 Vlan20

configure terminal
interface Gi1/0
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr

Gig 1/1 Vlan333
configure terminal
interface Gi1/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

Настройка SW4
Gig 0/2 Vlan20
configure terminal
interface Gi0/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr

Gig 0/3 Vlan333
configure terminal
interface Gi0/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

configure terminal
interface Gi1/1
switchport access vlan 333
no shutdown
end
wr

configure terminal
interface Gi1/0
switchport access vlan 20
no shutdown
end
wr

Настройка SW2 к SW3
Gig 0/2 Vlan20 Gig 0/3 Vlan333
configure terminal
interface Gi0/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr

configure terminal
interface Gi0/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

Настройка SW3 к SW2
Gig 0/2 Vlan20 Gig 0/3 Vlan333

```
configure terminal
interface Gi0/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr

configure terminal
interface Gi0/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

configure terminal
interface Gi1/1
switchport access vlan 333
no shutdown
end
wr

configure terminal
interface Gi1/0
switchport access vlan 20
no shutdown
end
wr
```

конфигурация портов на SW3 к SW1
sw3 Gig 0/0 Vlan20 Gig 0/1 Vlan333

```
configure terminal
interface Gi0/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

configure terminal
interface Gi0/0
switchport mode trunk
switchport trunk encapsulation dot1q
```

```
switchport trunk allowed vlan 20
no shutdown
end
wr
```

конфигурация портов на sw1 к sw3
sw1 Gig 0/2 Vlan20 Gig 0/3 Vlan333

```
configure terminal
interface Gi0/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr
```

```
configure terminal
interface Gi0/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

Настройка Sw1 к Sw2
Gig 0/0 Vlan20 Gig 0/1 Vlan333

```
configure terminal
interface Gi0/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr
```

```
configure terminal
interface Gi0/0
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

Настройка Sw2 к Sw1
Gig 0/0 Vlan20 Gig 0/1 Vlan333

```
configure terminal
interface Gi0/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

configure terminal
interface Gi0/0
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

Настройка Sw1 к Sw4
Gig 1/1 Vlan333 Gig 1/0 Vlan20

```
configure terminal
interface Gi1/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr

configure terminal
interface Gi1/0
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

Настройка Sw4 к Sw1
Gig 0/1 Vlan333 Gig 0/0 Vlan20

```
configure terminal
interface Gi0/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr
```

```
configure terminal
interface Gi0/0
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

Настройка Sw5 к Sw1
Gig 0/0 Vlan20 Gig 0/1 Vlan333

```
configure terminal
interface Gi0/1
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr
```

```
configure terminal
interface Gi0/0
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

Настройка Sw1 к Sw5
Gig 1/2 Vlan20 Gig 1/3 Vlan333

```
configure terminal
interface Gi1/3
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk native vlan 333
switchport trunk allowed vlan 333
no shutdown
end
wr
```

```
configure terminal
interface Gi1/2
switchport mode trunk
switchport trunk encapsulation dot1q
switchport trunk allowed vlan 20
no shutdown
end
wr
```

2. Проверить доступность персональных компьютеров, находящихся в одинаковых VLAN и недоступность находящихся в различных, результаты задокументировать

Проверяем пинги устройств с Vlan333, а именно PC2, PC4, PC6

```
PC2> ping 192.168.1.17

192.168.1.17 icmp_seq=1 ttl=64 time=0.001 ms
192.168.1.17 icmp_seq=2 ttl=64 time=0.001 ms
192.168.1.17 icmp_seq=3 ttl=64 time=0.001 ms
192.168.1.17 icmp_seq=4 ttl=64 time=0.001 ms
192.168.1.17 icmp_seq=5 ttl=64 time=0.001 ms

PC2> ping 192.168.1.19

84 bytes from 192.168.1.19 icmp_seq=1 ttl=64 time=7.940 ms
84 bytes from 192.168.1.19 icmp_seq=2 ttl=64 time=6.081 ms
84 bytes from 192.168.1.19 icmp_seq=3 ttl=64 time=17.311 ms
84 bytes from 192.168.1.19 icmp_seq=4 ttl=64 time=9.060 ms
84 bytes from 192.168.1.19 icmp_seq=5 ttl=64 time=5.994 ms

PC2> ping 192.168.1.21

84 bytes from 192.168.1.21 icmp_seq=1 ttl=64 time=17.919 ms
84 bytes from 192.168.1.21 icmp_seq=2 ttl=64 time=2.848 ms
84 bytes from 192.168.1.21 icmp_seq=3 ttl=64 time=9.142 ms
84 bytes from 192.168.1.21 icmp_seq=4 ttl=64 time=6.351 ms
84 bytes from 192.168.1.21 icmp_seq=5 ttl=64 time=14.636 ms
```

```
PC2> ping 192.168.1.16

host (192.168.1.16) not reachable

PC2> ping 192.168.1.18

host (192.168.1.18) not reachable

PC2> ping 192.168.1.20

host (192.168.1.20) not reachable
```

Аналогичная проверка для Vlan20

```
PC1> ping 192.168.1.18

84 bytes from 192.168.1.18 icmp_seq=1 ttl=64 time=17.196 ms
84 bytes from 192.168.1.18 icmp_seq=2 ttl=64 time=3.455 ms
84 bytes from 192.168.1.18 icmp_seq=3 ttl=64 time=2.144 ms
84 bytes from 192.168.1.18 icmp_seq=4 ttl=64 time=8.340 ms
84 bytes from 192.168.1.18 icmp_seq=5 ttl=64 time=13.460 ms

PC1> ping 192.168.1.20

84 bytes from 192.168.1.20 icmp_seq=1 ttl=64 time=5.779 ms
84 bytes from 192.168.1.20 icmp_seq=2 ttl=64 time=12.018 ms
84 bytes from 192.168.1.20 icmp_seq=3 ttl=64 time=8.827 ms
84 bytes from 192.168.1.20 icmp_seq=4 ttl=64 time=6.229 ms
84 bytes from 192.168.1.20 icmp_seq=5 ttl=64 time=8.401 ms
```

```
PC1> ping 192.168.1.17

host (192.168.1.17) not reachable

PC1> ping 192.168.1.19

host (192.168.1.19) not reachable

PC1> ping 192.168.1.21

host (192.168.1.21) not reachable
```

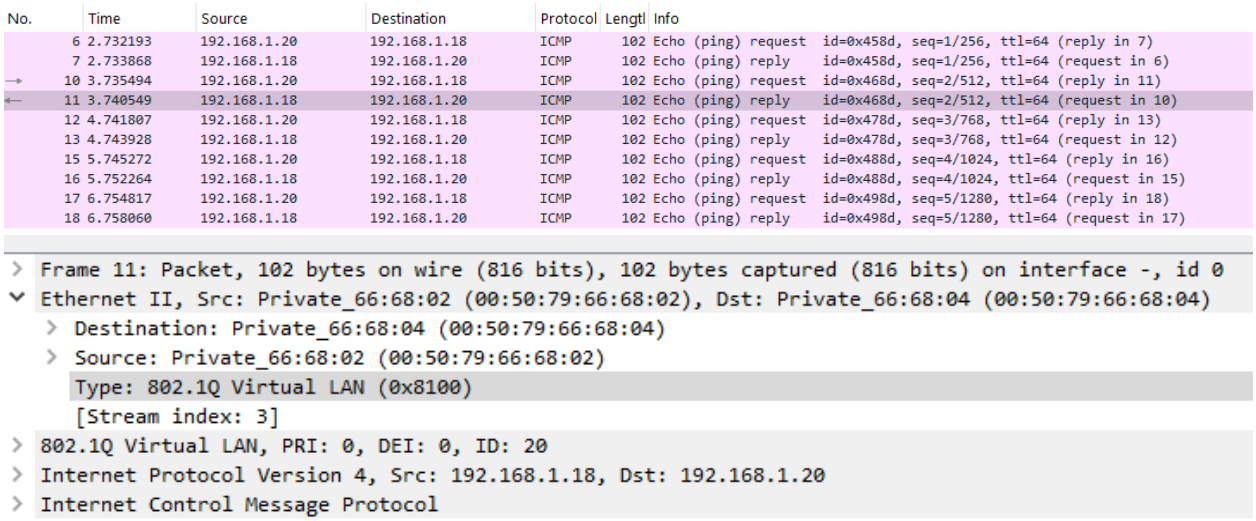
Как видим, всё работает исправно и адреса из разных Vlan не пингуются.

3. Перехватить в WireShark пакеты с тегами и без тегов (nb!), результаты задокументировать

11	10.047391	192.168.1.21	192.168.1.17	ICMP	98	Echo (ping) request id=0x8c8c, seq=1/256, ttl=64 (reply in 12)
12	10.051402	192.168.1.17	192.168.1.21	ICMP	98	Echo (ping) reply id=0x8c8c, seq=1/256, ttl=64 (request in 11)
14	11.053492	192.168.1.21	192.168.1.17	ICMP	98	Echo (ping) request id=0x8d8c, seq=2/512, ttl=64 (reply in 15)
15	11.059173	192.168.1.17	192.168.1.21	ICMP	98	Echo (ping) reply id=0x8d8c, seq=2/512, ttl=64 (request in 14)
16	12.060912	192.168.1.21	192.168.1.17	ICMP	98	Echo (ping) request id=0x8e8c, seq=3/768, ttl=64 (reply in 17)
17	12.067751	192.168.1.17	192.168.1.21	ICMP	98	Echo (ping) reply id=0x8e8c, seq=3/768, ttl=64 (request in 16)
19	13.069366	192.168.1.21	192.168.1.17	ICMP	98	Echo (ping) request id=0x8f8c, seq=4/1024, ttl=64 (reply in 20)
20	13.070578	192.168.1.17	192.168.1.21	ICMP	98	Echo (ping) reply id=0x8f8c, seq=4/1024, ttl=64 (request in 19)
21	14.072704	192.168.1.21	192.168.1.17	ICMP	98	Echo (ping) request id=0x908c, seq=5/1280, ttl=64 (reply in 22)
22	14.076426	192.168.1.17	192.168.1.21	ICMP	98	Echo (ping) reply id=0x908c, seq=5/1280, ttl=64 (request in 21)

```
> Frame 15: Packet, 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on interface -, id 0
v Ethernet II, Src: Private_66:68:01 (00:50:79:66:68:01), Dst: Private_66:68:05 (00:50:79:66:68:05)
  > Destination: Private_66:68:05 (00:50:79:66:68:05)
  > Source: Private_66:68:01 (00:50:79:66:68:01)
    Type: IPv4 (0x0800)
    [Stream index: 5]
```

Как видим Type: IPv4 (0x0800), значит тега нет



Тут тег есть Type: 802.1Q Virtual LAN (0x8100)

4. Сохранить файлы конфигураций устройств в виде набора файлов с именами, соответствующими именам устройств