

ОТЧЁТ

Лабораторная работа №3

“Настройка виртуальной локальной сети (VLAN)“

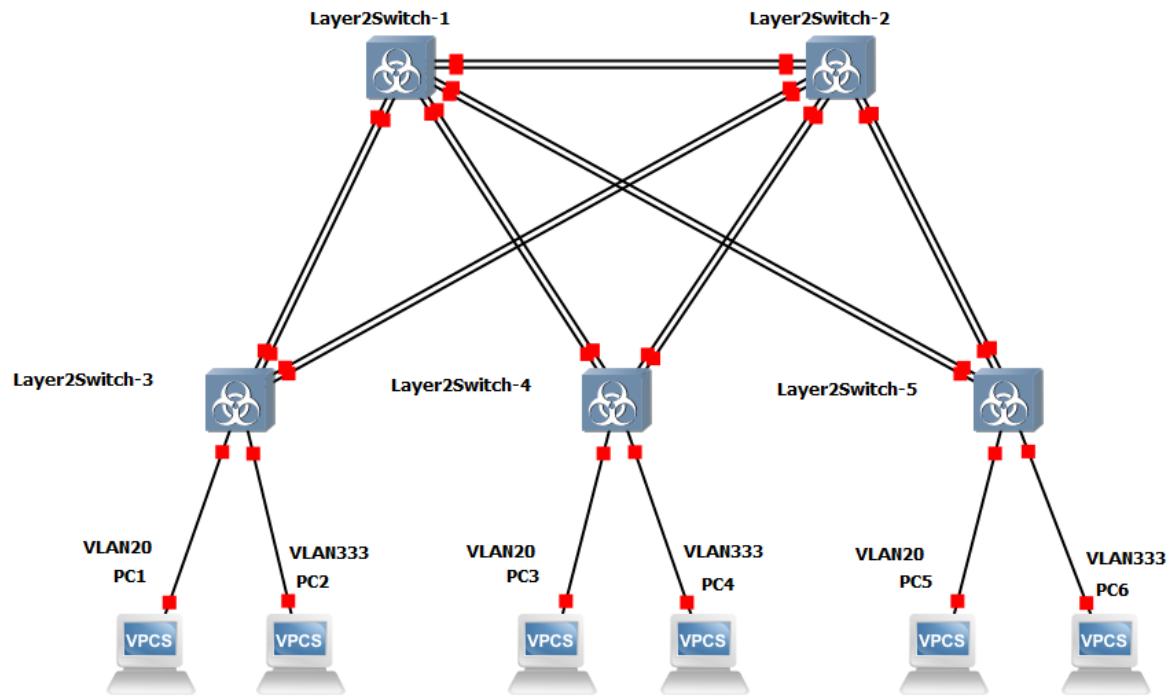
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Ход работы

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
```

Возникла 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

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

PC2> ping 192.168.1.21

34 bytes from 192.168.1.21 icmp_seq=1 ttl=64 time=17.919 ms
34 bytes from 192.168.1.21 icmp_seq=2 ttl=64 time=2.848 ms
34 bytes from 192.168.1.21 icmp_seq=3 ttl=64 time=9.142 ms
34 bytes from 192.168.1.21 icmp_seq=4 ttl=64 time=6.351 ms
34 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
└> 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

No.	Time	Source	Destination	Protocol	Length	Info
6	2.732193	192.168.1.20	192.168.1.18	ICMP	102	Echo (ping) request id=0x458d, seq=1/256, ttl=64 (reply in 7)
7	2.733868	192.168.1.18	192.168.1.20	ICMP	102	Echo (ping) reply id=0x458d, seq=1/256, ttl=64 (request in 6)
→	10 3.735494	192.168.1.20	192.168.1.18	ICMP	102	Echo (ping) request id=0x468d, seq=2/512, ttl=64 (reply in 11)
←	11 3.740549	192.168.1.18	192.168.1.20	ICMP	102	Echo (ping) reply id=0x468d, seq=2/512, ttl=64 (request in 10)
12	4.741807	192.168.1.20	192.168.1.18	ICMP	102	Echo (ping) request id=0x478d, seq=3/768, ttl=64 (reply in 13)
13	4.743928	192.168.1.18	192.168.1.20	ICMP	102	Echo (ping) reply id=0x478d, seq=3/768, ttl=64 (request in 12)
15	5.745272	192.168.1.20	192.168.1.18	ICMP	102	Echo (ping) request id=0x488d, seq=4/1024, ttl=64 (reply in 16)
16	5.752264	192.168.1.18	192.168.1.20	ICMP	102	Echo (ping) reply id=0x488d, seq=4/1024, ttl=64 (request in 15)
17	6.754817	192.168.1.20	192.168.1.18	ICMP	102	Echo (ping) request id=0x498d, seq=5/1280, ttl=64 (reply in 18)
18	6.758060	192.168.1.18	192.168.1.20	ICMP	102	Echo (ping) reply id=0x498d, seq=5/1280, ttl=64 (request in 17)

> Frame 11: Packet, 102 bytes on wire (816 bits), 102 bytes captured (816 bits) on interface -, id 0
 ✓ Ethernet II, Src: Private_66:68:02 (00:50:79:66:68:02), Dst: Private_66:68:04 (00:50:79:66:68:04)
 > Destination: Private_66:68:04 (00:50:79:66:68:04)
 > Source: Private_66:68:02 (00:50:79:66:68:02)
 Type: 802.1Q Virtual LAN (0x8100)
 [Stream index: 3]
 > 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 20
 > Internet Protocol Version 4, Src: 192.168.1.18, Dst: 192.168.1.20
 > Internet Control Message Protocol

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

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

```

enable
terminal length 0
show running-config
exit
  
```