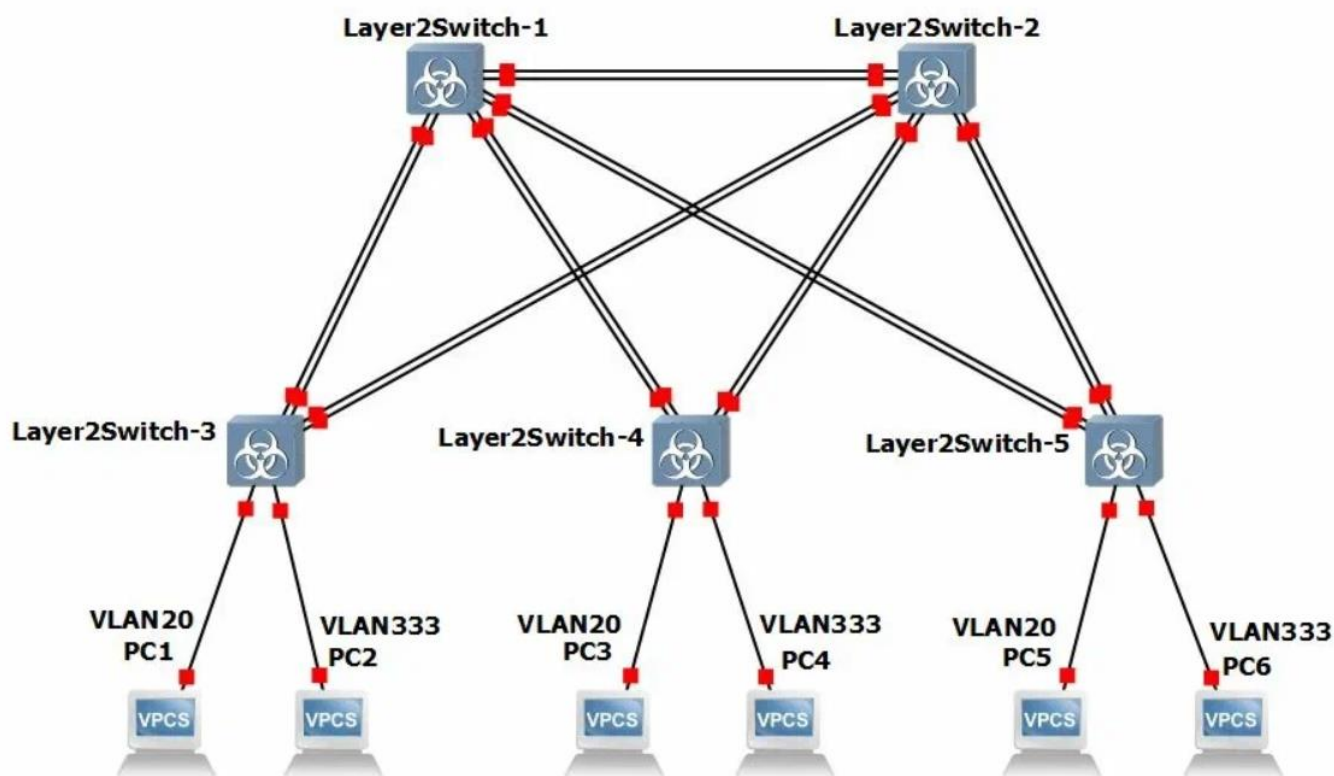


Туртугешев А.В.

Тема: Настройка виртуальной локальной сети (VLAN)

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

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В схеме schema-lab3 VLAN20 иVLAN333 уже созданы и в состоянии active, перейдем к настройкам.

### Layer2Switch-3

Назначаем VLAN для портов, подключенных к PC1 и PC2.

- Switch>enable
- Switch#conf ter
- Switch(config)#interface Gi1/0
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport access vlan 20
- Switch(config-if)#exit

- Switch(config)#interface Gi1/1
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport access vlan 333
- Switch(config-if)#exit
- Switch#wr

Проверим VLAN и порты:

```

Switch>enable
Switch#show vlan brief

```

VLAN	Name	Status	Ports
1	default	active	
20	VLAN20	active	Gi1/0
100	VLAN100	active	
200	VLAN0200	active	
300	VLAN0300	active	
333	VLAN333	active	Gi1/1
1002	fddi-default	act/unsup	
1003	trcrf-default	act/unsup	
1004	fddinet-default	act/unsup	
1005	trbrf-default	act/unsup	

### Настройка портов для магистральных соединений.

**show interfaces trunk** - выводит информацию обо всех интерфейсах магистральных каналов, работающих в настоящий момент.

```
Layer2Switch-3 - PuTTY
Switch#show interface trunk

Port      Mode           Encapsulation  Status        Native vlan
Gi0/0     desirable      n-isl           trunking      1
Gi0/1     desirable      n-isl           trunking      1
Gi0/2     desirable      n-isl           trunking      1
Gi0/3     desirable      n-isl           trunking      1

Port      Vlans allowed on trunk
Gi0/0     1-4094
Gi0/1     1-4094
Gi0/2     1-4094
Gi0/3     1-4094

Port      Vlans allowed and active in management domain
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333
Switch#
```

- Все порты работают в режиме trunk
- Используется устаревшая инкапсуляция n-isl вместо dot1q
- Установлен Native VLAN = 1
- Разрешены VLAN (от 1 до 4094)

Настроим trunk портов на использование **dot1q** и разрешить передачу только **VLAN 20 и VLAN 333**.

- Switch#conf ter
- Switch(config)#interface range Gi0/0 - 3
- Switch(config-if-range)#switchport trunk encapsulation dot1q
- Switch(config-if-range)#switchport mode trunk
- Switch(config-if-range)#switchport trunk allowed vlan 20,333
- Switch(config-if-range)#switchport trunk native vlan 333
- Switch(config-if-range)#^Z
- Switch#.wr

```
Layer2Switch-3 - PuTTY
Switch#show interface trunk

Port      Mode      Encapsulation  Status      Native vlan
Gi0/0     on        802.1q         trunking    333
Gi0/1     on        802.1q         trunking    333
Gi0/2     on        802.1q         trunking    333
Gi0/3     on        802.1q         trunking    333

Port      Vlans allowed on trunk
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333

Port      Vlans allowed and active in management domain
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333
Switch#
```

Теперь передача разрешена к передаче только VLAN 20 и VLAN 333 и используется протокол IEEE 802.1Q, Native vlan = 333.

## Layer2Switch-4

Назначаем VLAN для портов, подключенных к PC3 и PC4.

- Switch>enable
- Switch#conf ter
- Switch(config)#interface Gi1/0
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport access vlan 20
- Switch(config-if)#exit
- Switch(config)#interface Gi1/1
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport access vlan 333

- Switch(config-if)#exit
- Switch#wr

```

Layer2Switch-4 - PuTTY
Switch#show vlan brief

VLAN Name                Status    Ports
----
1    default                active
20   VLAN20                  active    Gi1/0
100  VLAN100                 active
200  VLAN0200               active
300  VLAN0300               active
333  VLAN333                 active    Gi1/1
1002 fddi-default            act/unsup
1003 trcrf-default         act/unsup
1004 fddinet-default        act/unsup
1005 trbrf-default         act/unsup
Switch#

```

## Настройка портов для магистральных соединений.

```

Layer2Switch-4 - PuTTY
Switch#show interface trunk

Port      Mode           Encapsulation  Status        Native vlan
Gi0/0     desirable     n-isl          trunking      1
Gi0/1     desirable     n-isl          trunking      1
Gi0/2     desirable     n-isl          trunking      1
Gi0/3     desirable     n-isl          trunking      1

Port      Vlans allowed on trunk
Gi0/0     1-4094
Gi0/1     1-4094
Gi0/2     1-4094
Gi0/3     1-4094

Port      Vlans allowed and active in management domain
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333

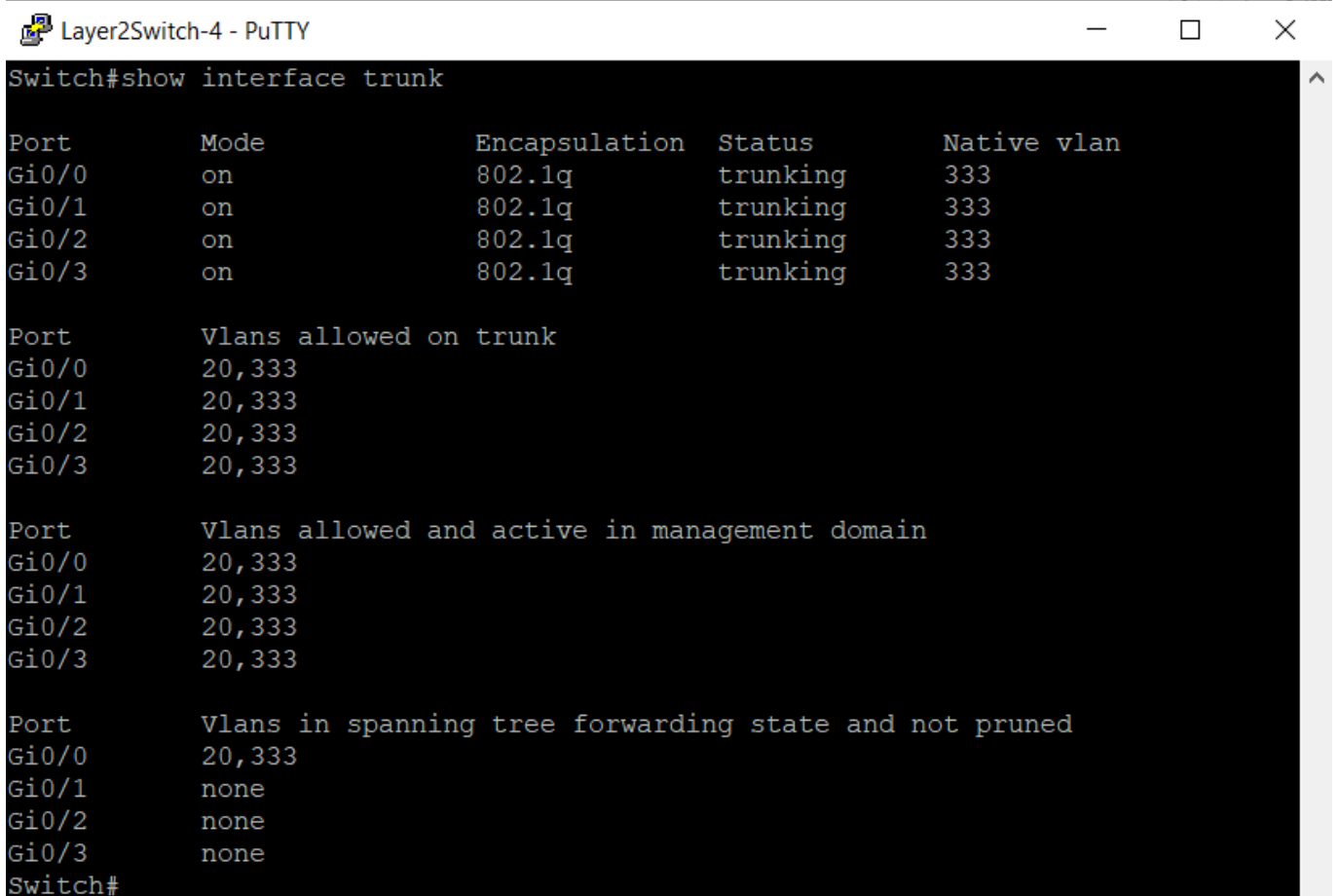
Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     1,20,100,200,300,333
Gi0/1     20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333
Switch#

```

Выполняем тоже самое что и для Layer2Switch-3.

- Switch#conf ter
- Switch(config)#interface range Gi0/0 - 3

- Switch(config-if-range)#switchport trunk encapsulation dot1q
- Switch(config-if-range)#switchport mode trunk
- Switch(config-if-range)#switchport trunk allowed vlan 20,333
- Switch(config-if-range)#switchport trunk native vlan 333
- Switch(config-if-range)#^Z
- Switch#.wr



```

Switch#show interface trunk

Port      Mode      Encapsulation  Status        Native vlan
Gi0/0     on        802.1q         trunking      333
Gi0/1     on        802.1q         trunking      333
Gi0/2     on        802.1q         trunking      333
Gi0/3     on        802.1q         trunking      333

Port      Vlans allowed on trunk
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333

Port      Vlans allowed and active in management domain
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     20,333
Gi0/1     none
Gi0/2     none
Gi0/3     none
Switch#

```

Теперь передача разрешена к передаче только VLAN 20 и VLAN 333 и используется протокол IEEE 802.1Q, Native vlan = 333.

## Layer2Switch-5

Назначаем VLAN для портов, подключенных к PC5 и PC6.

- Switch>enable
- Switch#conf ter
- Switch(config)#interface Gi1/0

- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport access vlan 20
- Switch(config-if)#exit
- Switch(config)#interface Gi1/1
- Switch(config-if)#switchport mode access
- Switch(config-if)#switchport access vlan 333
- Switch(config-if)#^Z
- Switch#wr

```

Layer2Switch-5 - PuTTY
Switch#show vlan brief

VLAN Name                Status    Ports
----
1    default              active
20   VLAN20               active    Gi1/0
100  VLAN100              active
200  VLAN0200             active
300  VLAN0300             active
333  VLAN333              active    Gi1/1
1002 fddi-default          act/unsup
1003 trcrf-default       act/unsup
1004 fddinet-default      act/unsup
1005 trbrf-default       act/unsup
Switch#

```

### Настройка портов для магистральных соединений.

Информацию обо всех интерфейсах магистральных каналов, работающих в настоящий момент

```
Layer2Switch-5 - PuTTY
Switch#show interface trunk

Port      Mode           Encapsulation  Status        Native vlan
Gi0/0     desirable      n-isl          trunking      1
Gi0/1     desirable      n-isl          trunking      1
Gi0/2     desirable      n-isl          trunking      1
Gi0/3     desirable      n-isl          trunking      1

Port      Vlans allowed on trunk
Gi0/0     1-4094
Gi0/1     1-4094
Gi0/2     1-4094
Gi0/3     1-4094

Port      Vlans allowed and active in management domain
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     1,20,100,200,300,333
Gi0/1     20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333
Switch#
```

Выполняем те же команды что и для Layer2Switch-3 и Layer2Switch-4.

- Switch#conf ter
- Switch(config)#interface range Gi0/0 - 3
- Switch(config-if-range)#switchport trunk encapsulation dot1q
- Switch(config-if-range)#switchport mode trunk
- Switch(config-if-range)#switchport trunk allowed vlan 20,333
- Switch(config-if-range)#switchport trunk native vlan 333
- Switch(config-if-range)#^Z
- Switch#.wr



```
Layer2Switch-5 - PuTTY
Switch>enable
Switch#show interface trunk

Port      Mode           Encapsulation  Status        Native vlan
Gi0/0     on             802.1q         trunking      333
Gi0/1     on             802.1q         trunking      333
Gi0/2     on             802.1q         trunking      333
Gi0/3     on             802.1q         trunking      333

Port      Vlans allowed on trunk
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333

Port      Vlans allowed and active in management domain
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     20,333
Gi0/1     none
Gi0/2     none
Gi0/3     none
Switch#
```

Передача разрешена к передаче только VLAN 20 и VLAN 333 и используется протокол IEEE 802.1Q.

## Layer2Switch-1

**Настройка портов для магистральных соединений.**

```
Layer2Switch-1 - PuTTY
Switch#show interface trunk

Port      Mode           Encapsulation  Status        Native vlan
Gi0/0     desirable     n-isl          trunking      1
Gi0/1     desirable     n-isl          trunking      1
Gi0/2     desirable     n-802.1q       trunking      1
Gi0/3     desirable     n-802.1q       trunking      1
Gi1/0     desirable     n-802.1q       trunking      1
Gi1/1     desirable     n-802.1q       trunking      1
Gi1/2     desirable     n-802.1q       trunking      1
Gi1/3     desirable     n-802.1q       trunking      1

Port      Vlans allowed on trunk
Gi0/0     1-4094
Gi0/1     1-4094
Gi0/2     1-4094
Gi0/3     1-4094
Gi1/0     1-4094
Gi1/1     1-4094
Gi1/2     1-4094
Gi1/3     1-4094

Port      Vlans allowed and active in management domain
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333
Gi1/0     1,20,100,200,300,333
Gi1/1     1,20,100,200,300,333
Gi1/2     1,20,100,200,300,333
Gi1/3     1,20,100,200,300,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,100,200,300
Gi1/0     1,20,100,200,300,333
Gi1/1     1,20,100,200,300,333
Gi1/2     1,20,100,200,300,333
Gi1/3     1,20,100,200,300,333
Switch#
```

Изменим инкапсуляцию ISL на dot1q и ограничим список разрешённых VLAN, переведем интерфейс коммутатора в режим магистрального порта.

- Switch#conf ter
- Switch(config)#interface range Gi0/0 - 3
- Switch(config-if-range)#switchport trunk encapsulation dot1q
- Switch(config-if-range)#switchport mode trunk
- Switch(config-if-range)#switchport trunk allowed vlan 20,333

- Switch(config-if-range)#switchport trunk native vlan 1
- Switch(config-if-range)#exit
- Switch(config)#interface range Gi1/0 - 3
- Switch(config-if-range)#switchport trunk encapsulation dot1q
- Switch(config-if-range)#switchport mode trunk
- Switch(config-if-range)#switchport trunk allowed vlan 20,333
- Switch(config-if-range)#switchport trunk native vlan 1
- Switch(config-if-range)#exit
- Switch(config)#^Z
- Switch#wr

```
Layer2Switch-1 - PuTTY
Switch#show interface trunk

Port      Mode      Encapsulation  Status      Native vlan
Gi0/0     on        802.1q         trunking    333
Gi0/1     on        802.1q         trunking    333
Gi0/2     on        802.1q         trunking    333
Gi0/3     on        802.1q         trunking    333
Gi1/0     on        802.1q         trunking    333
Gi1/1     on        802.1q         trunking    333
Gi1/2     on        802.1q         trunking    333
Gi1/3     on        802.1q         trunking    333

Port      Vlans allowed on trunk
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333
Gi1/0     20,333
Gi1/1     20,333
Gi1/2     20,333
Gi1/3     20,333

Port      Vlans allowed and active in management domain
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333
Gi1/0     20,333
Gi1/1     20,333
Gi1/2     20,333
Gi1/3     20,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     none
Gi1/0     20,333
Gi1/1     20,333
Gi1/2     20,333
Gi1/3     20,333
Switch#
```

Передача разрешена к передаче только VLAN 20 и VLAN 333 и используется протокол IEEE 802.1Q.

Порт Gi0/3 не пропускает ни одну VLAN через себя, он блокируется протоколом STP.

## Layer2Switch-2

**Настройка портов для магистральных соединений.**

```
Layer2Switch-2 - PuTTY
Switch#show interface trunk

Port      Mode           Encapsulation  Status        Native vlan
Gi0/0     desirable      n-802.1q        trunking      1
Gi0/1     desirable      n-802.1q        trunking      1
Gi0/2     desirable      n-802.1q        trunking      1
Gi0/3     desirable      n-802.1q        trunking      1
Gi1/0     desirable      n-802.1q        trunking      1
Gi1/1     desirable      n-802.1q        trunking      1
Gi1/2     desirable      n-802.1q        trunking      1
Gi1/3     desirable      n-802.1q        trunking      1

Port      Vlans allowed on trunk
Gi0/0     1-4094
Gi0/1     1-4094
Gi0/2     1-4094
Gi0/3     1-4094
Gi1/0     1-4094
Gi1/1     1-4094
Gi1/2     1-4094
Gi1/3     1-4094

Port      Vlans allowed and active in management domain
Gi0/0     1,20,100,200,300,333
Gi0/1     1,20,100,200,300,333
Gi0/2     1,20,100,200,300,333
Gi0/3     1,20,100,200,300,333
Gi1/0     1,20,100,200,300,333
Gi1/1     1,20,100,200,300,333
Gi1/2     1,20,100,200,300,333
Gi1/3     1,20,100,200,300,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     1,100,200,300
Gi0/1     1,100,200,300
Gi0/2     1,20,100,200,300,333
Gi0/3     1,100,200,300
Gi1/0     1,20,100,200,300,333
Gi1/1     1,20,100,200,300,333
Gi1/2     1,20,100,200,300,333
Gi1/3     1,20,100,200,300,333
Switch#
```

Ограничим список разрешённых VLAN, переведем интерфейс коммутатора в режим магистрального порта.

```
Switch#conf ter
Switch(config)#interface range Gi0/0 - 3
Switch(config-if-range)#switchport trunk encapsulation dot1q
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 20,333
```

```
Switch(config-if-range)#switchport trunk native vlan 333
Switch(config-if-range)#exit
Switch(config)#interface range Gi1/0 - 3
Switch(config-if-range)#switchport trunk encapsulation dot1q
Switch(config-if-range)#switchport mode trunk
Switch(config-if-range)#switchport trunk allowed vlan 20,333
Switch(config-if-range)#switchport trunk native vlan 1
Switch(config-if-range)#exit
Switch(config)#^Z
Switch#wr
```

```
Layer2Switch-2 - PuTTY
Switch#show interface trunk

Port      Mode      Encapsulation  Status      Native vlan
Gi0/0     on        802.1q         trunking    333
Gi0/1     on        802.1q         trunking    333
Gi0/2     on        802.1q         trunking    333
Gi0/3     on        802.1q         trunking    333
Gi1/0     on        802.1q         trunking    333
Gi1/1     on        802.1q         trunking    333
Gi1/2     on        802.1q         trunking    333
Gi1/3     on        802.1q         trunking    333

Port      Vlans allowed on trunk
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333
Gi1/0     20,333
Gi1/1     20,333
Gi1/2     20,333
Gi1/3     20,333

Port      Vlans allowed and active in management domain
Gi0/0     20,333
Gi0/1     20,333
Gi0/2     20,333
Gi0/3     20,333
Gi1/0     20,333
Gi1/1     20,333
Gi1/2     20,333
Gi1/3     20,333

Port      Vlans in spanning tree forwarding state and not pruned
Gi0/0     none
Gi0/1     none
Gi0/2     20,333
Gi0/3     none
Gi1/0     20,333
Gi1/1     20,333
Gi1/2     20,333
Gi1/3     20,333
Switch#
```

Gi0/0, Gi0/1, Gi0/3 отключены так как заблокированы STP.

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

- PC1

```
PC1 - PuTTY
PC1> ping 192.168.1.2
host (192.168.1.2) not reachable

PC1> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=1.911 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=5.517 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=64 time=6.899 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=64 time=8.224 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=64 time=7.327 ms

PC1> ping 192.168.1.4
host (192.168.1.4) not reachable

PC1> ping 192.168.1.5
84 bytes from 192.168.1.5 icmp_seq=1 ttl=64 time=9.469 ms
84 bytes from 192.168.1.5 icmp_seq=2 ttl=64 time=13.323 ms
84 bytes from 192.168.1.5 icmp_seq=3 ttl=64 time=3.912 ms
84 bytes from 192.168.1.5 icmp_seq=4 ttl=64 time=1.713 ms
84 bytes from 192.168.1.5 icmp_seq=5 ttl=64 time=14.048 ms

PC1> ping 192.168.1.6
host (192.168.1.6) not reachable

PC1>
```

- PC2



```
PC2> ping 192.168.1.1
host (192.168.1.1) not reachable

PC2> ping 192.168.1.3
host (192.168.1.3) not reachable

PC2> ping 192.168.1.4
84 bytes from 192.168.1.4 icmp_seq=1 ttl=64 time=7.260 ms
84 bytes from 192.168.1.4 icmp_seq=2 ttl=64 time=15.786 ms
84 bytes from 192.168.1.4 icmp_seq=3 ttl=64 time=5.555 ms
84 bytes from 192.168.1.4 icmp_seq=4 ttl=64 time=12.972 ms
84 bytes from 192.168.1.4 icmp_seq=5 ttl=64 time=3.261 ms

PC2> ping 192.168.1.5
host (192.168.1.5) not reachable

PC2> ping 192.168.1.6
84 bytes from 192.168.1.6 icmp_seq=1 ttl=64 time=7.765 ms
84 bytes from 192.168.1.6 icmp_seq=2 ttl=64 time=16.312 ms
84 bytes from 192.168.1.6 icmp_seq=3 ttl=64 time=7.697 ms
84 bytes from 192.168.1.6 icmp_seq=4 ttl=64 time=1.850 ms
84 bytes from 192.168.1.6 icmp_seq=5 ttl=64 time=3.632 ms

PC2>
```

- **PC3**

```
PC3 - PuTTY
PC3> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=15.244 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=6.319 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=6.910 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=5.251 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=5.516 ms

PC3> ping 192.168.1.2

host (192.168.1.2) not reachable

PC3> ping 192.168.1.4

host (192.168.1.4) not reachable

PC3> ping 192.168.1.5

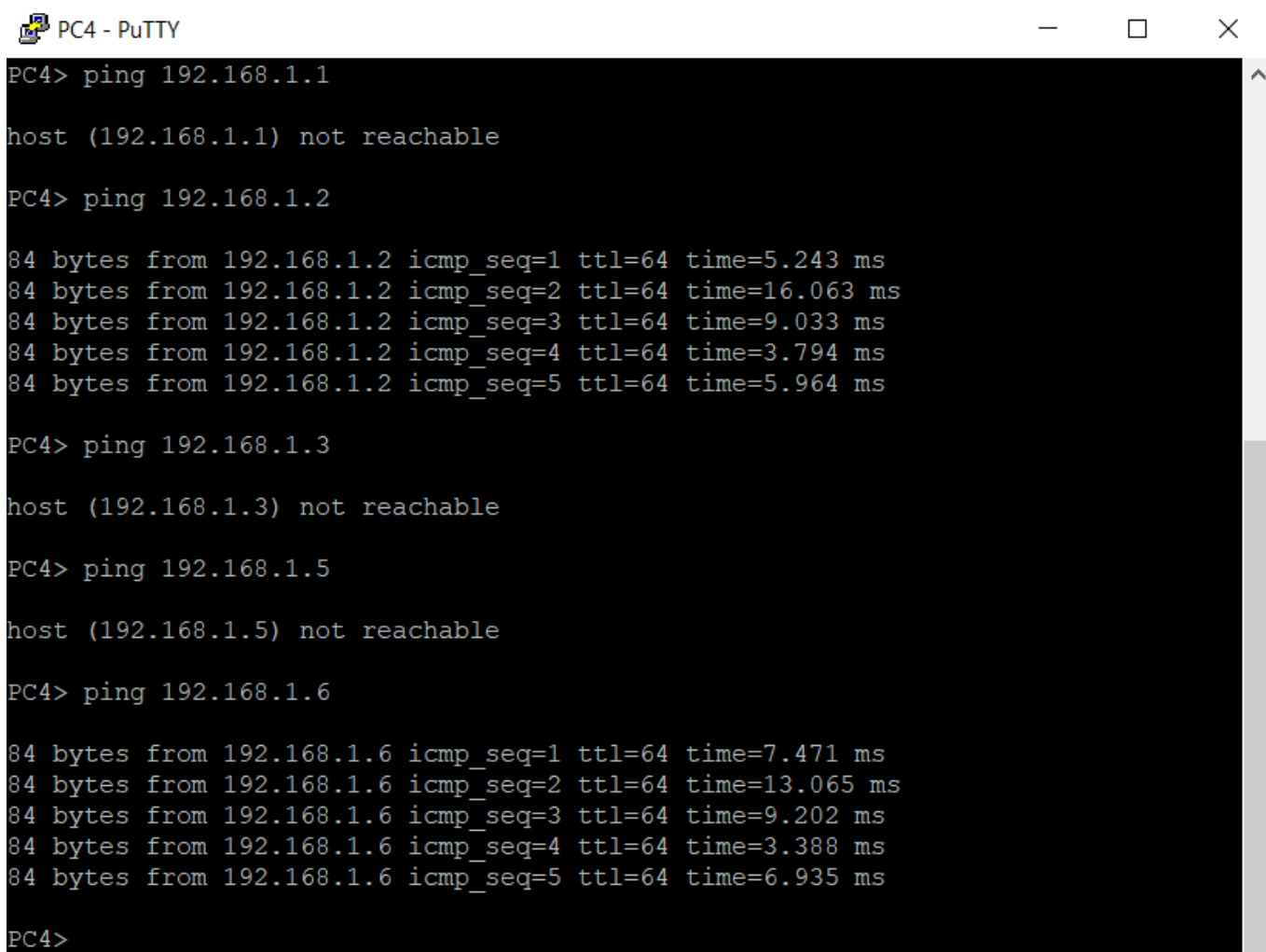
84 bytes from 192.168.1.5 icmp_seq=1 ttl=64 time=6.663 ms
84 bytes from 192.168.1.5 icmp_seq=2 ttl=64 time=4.689 ms
84 bytes from 192.168.1.5 icmp_seq=3 ttl=64 time=3.649 ms
84 bytes from 192.168.1.5 icmp_seq=4 ttl=64 time=5.167 ms
84 bytes from 192.168.1.5 icmp_seq=5 ttl=64 time=13.849 ms

PC3> ping 192.168.1.6

host (192.168.1.6) not reachable

PC3>
```

- **PC4**



```
PC4> ping 192.168.1.1
host (192.168.1.1) not reachable

PC4> ping 192.168.1.2
84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=5.243 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=16.063 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=9.033 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=3.794 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=5.964 ms

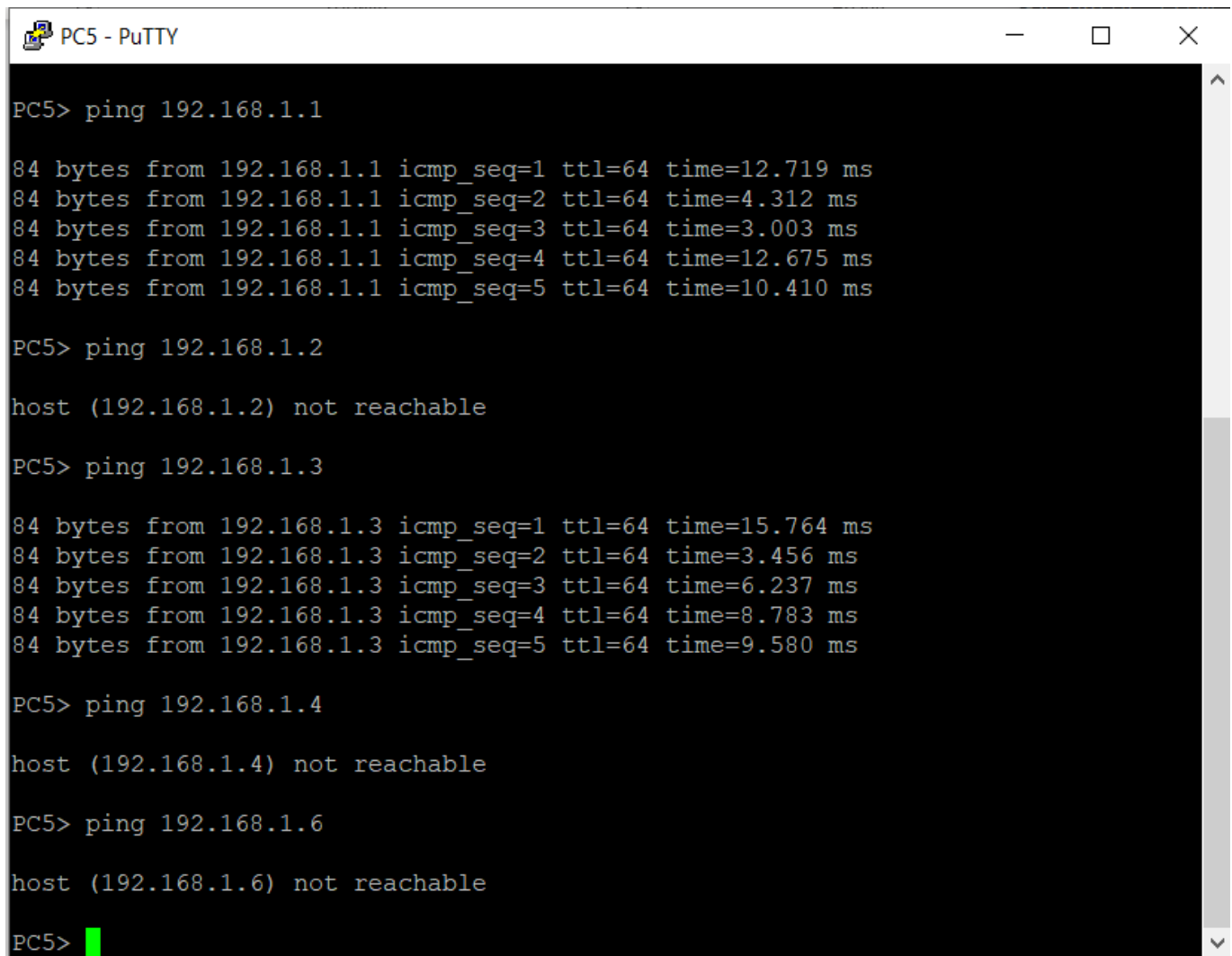
PC4> ping 192.168.1.3
host (192.168.1.3) not reachable

PC4> ping 192.168.1.5
host (192.168.1.5) not reachable

PC4> ping 192.168.1.6
84 bytes from 192.168.1.6 icmp_seq=1 ttl=64 time=7.471 ms
84 bytes from 192.168.1.6 icmp_seq=2 ttl=64 time=13.065 ms
84 bytes from 192.168.1.6 icmp_seq=3 ttl=64 time=9.202 ms
84 bytes from 192.168.1.6 icmp_seq=4 ttl=64 time=3.388 ms
84 bytes from 192.168.1.6 icmp_seq=5 ttl=64 time=6.935 ms

PC4>
```

- **PC5**



```
PC5> ping 192.168.1.1

84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=12.719 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=4.312 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=3.003 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=12.675 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=10.410 ms

PC5> ping 192.168.1.2

host (192.168.1.2) not reachable

PC5> ping 192.168.1.3

84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=15.764 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=3.456 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=64 time=6.237 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=64 time=8.783 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=64 time=9.580 ms

PC5> ping 192.168.1.4

host (192.168.1.4) not reachable

PC5> ping 192.168.1.6

host (192.168.1.6) not reachable

PC5> █
```

- PC6

```
PC6 - PuTTY

PC6> ping 192.168.1.1

host (192.168.1.1) not reachable

PC6> ping 192.168.1.2

84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=12.603 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=6.135 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=9.963 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=6.857 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=6.486 ms

PC6> ping 192.168.1.3

host (192.168.1.3) not reachable

PC6> ping 192.168.1.4

84 bytes from 192.168.1.4 icmp_seq=1 ttl=64 time=13.929 ms
84 bytes from 192.168.1.4 icmp_seq=2 ttl=64 time=10.822 ms
84 bytes from 192.168.1.4 icmp_seq=3 ttl=64 time=3.135 ms
84 bytes from 192.168.1.4 icmp_seq=4 ttl=64 time=7.705 ms
84 bytes from 192.168.1.4 icmp_seq=5 ttl=64 time=7.486 ms

PC6> ping 192.168.1.5

host (192.168.1.5) not reachable

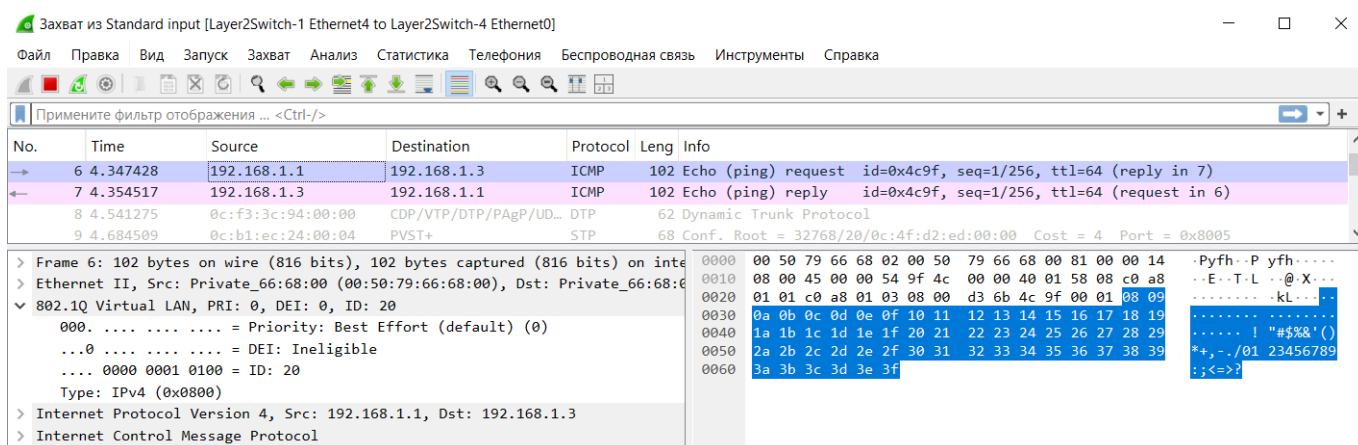
PC6>
```

Пинг проходит ко всем PC, которые принадлежат к одной и той же VLAN.

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

**Перехват пакетов с тегами. Ping PC1 -> PC3.**

Подключен Wireshark к порту между Layer2Switch-1 и Layer2Switch-4.



Пакеты содержат тег IEEE 802.1Q с ID VLAN = 20.

## Перехват пакетов без тегов. Ping PC2 -> PC6.

Захват из Standard input [Layer2Switch-1 Ethernet6 to Layer2Switch-5 Ethernet0]						
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка						
Примените фильтр отображения ... <Ctrl-/>						
No.	Time	Source	Destination	Protocol	Leng	Info
10	6.010875	0c:b1:ec:24:00:06	PVST+	STP	68	Conf. Root = 32768/333/0c:4f:d2:ed:00:00 Cost = 4 Port = 0x8007
11	7.391577	Private_66:68:01	Broadcast	ARP	64	Who has 192.168.1.6? Tell 192.168.1.2
12	7.392706	Private_66:68:05	Private_66:68:01	ARP	64	192.168.1.6 is at 00:50:79:66:68:05
→ 13	7.399226	192.168.1.2	192.168.1.6	ICMP	98	Echo (ping) request id=0xe8a1, seq=1/256, ttl=64 (reply in 14)
← 14	7.402236	192.168.1.6	192.168.1.2	ICMP	98	Echo (ping) reply id=0xe8a1, seq=1/256, ttl=64 (request in 13)
15	8.002380	0c:b1:ec:24:00:06	PVST+	STP	68	Conf. Root = 32768/20/0c:4f:d2:ed:00:00 Cost = 4 Port = 0x8007
16	8.011775	0c:b1:ec:24:00:06	PVST+	STP	68	Conf. Root = 32768/333/0c:4f:d2:ed:00:00 Cost = 4 Port = 0x8007
> Frame 13: 98 bytes on wire (784 bits), 98 bytes captured (784 bits) on inter						
> Ethernet II, Src: Private_66:68:01 (00:50:79:66:68:01), Dst: Private_66:68:05						
> Internet Protocol Version 4, Src: 192.168.1.2, Dst: 192.168.1.6						
> Internet Control Message Protocol						
0000 00 50 79 66 68 05 00 50 79 66 68 01 08 00 45 00 .Pyfh..P yfh...E. 0010 00 54 a1 e8 00 00 40 01 55 68 c0 a8 01 02 c0 a8 .T....@. Uh.... 0020 01 06 08 00 37 69 e8 a1 00 01 08 09 0a 0b 0c 0d ..-71.. 0030 0e 0f 10 11 12 13 14 15 16 17 18 19 1a 1b 1c 1d ..... 0040 1e 1f 20 21 22 23 24 25 26 27 28 29 2a 2b 2c 2d ..!"#\$%&'()*+,- 0050 2e 2f 30 31 32 33 34 35 36 37 38 39 3a 3b 3c 3d ./012345 6789;<= 0060 3e 3f >?						

Трафик передается через Native VLAN т.е без тегов.

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