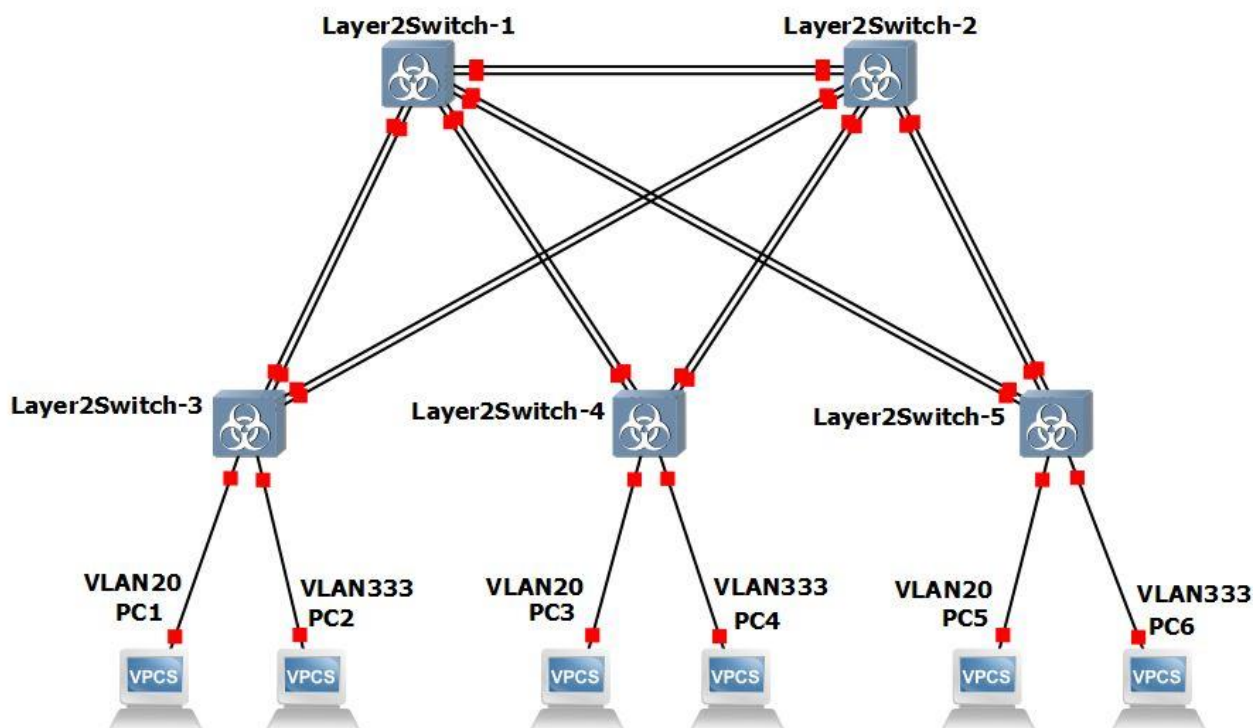# Тема: Настройка виртуальной локальной сети (VLAN)

1) Для заданной на схеме schema-lab4 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.

Порты коммутаторов к ПК будут настроены в режиме access VLAN 20 (для PC 1, 3, 5) и VLAN 333 (для PC 2, 4, 6). Одна из двух пар портов между коммутаторами будет настроена в режиме trunk для VLAN 20. Вторая пара портов между коммутаторами будет иметь trunk native vlan 333.

<u>Настройка портов между коммутаторами (VLAN 20):</u>

```
int range g0/0,g0/2,g1/0,g1/2
switchport trunk encapsulation dot1q
switchport mode trunk
switchport trunk allowed vlan 20
```

Настройка портов между коммутаторами (NATIVE VLAN 333):

```
int range g0/1,g0/3,g1/1,g1/3
switchport trunk encapsulation dot1q
switchport mode trunk
switchport trunk native vlan 333
```

Результат настройки коммутатора 1:


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

Port            Vlans allowed on trunk
Gi0/0           20
Gi0/1           1-4094
Gi0/2           20
Gi0/3           1-4094
Gi1/0           20
Gi1/1           1-4094
Gi1/2           20
Gi1/3           1-4094

Port            Vlans allowed and active in management domain
Gi0/0           20
 --More--
```

Настройка портов коммутаторов 3, 4 и 5 (VLAN 20, VLAN 333):

```
int g1/0
switchport access vlan 20
switchport mode access
description to-PC1
int g1/1
switchport access vlan 333
switchport mode access
description to-PC2
```



```
* be used for production purposes or deployed in a production   *
* environment.                                                  *
*                                                               *
* By using the software, you agree to abide by the terms and conditions *
* of the Cisco Early Field Trial Agreement as well as the terms and *
* conditions of the Cisco End User License Agreement at         *
* http://www.cisco.com/go/eula                                  *
*                                                               *
* Unauthorized use or distribution of this software is expressly *
* Prohibited.                                                   *
****************************************************************
S3>en
S3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
S3(config)#int g1/0
S3(config-if)#switchport access vlan 20
S3(config-if)#switchport mode access
S3(config-if)#description to-PC1
S3(config-if)#int g1/1
S3(config-if)#switchport access vlan 333
S3(config-if)#switchport mode access
S3(config-if)#description to-PC2
S3(config-if)#end
S3#
```

Результат настройки 3 коммутатора:

```
Layer2Switch-4 - PuTTY                                    —    □    ✕

S3#
S3#
S3#
S3#
S3#
S3#
S3#
*Aug 10 06:33:40.982: %SYS-5-CONFIG_I: Configured from console by consolesh
% Type "show ?" for a list of subcommands
S3#sh vlan br

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
S3#
```

```
Layer2Switch-4 - PuTTY                                    —    □    ✕

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

Port        Vlans allowed on trunk
Gi0/0       20
Gi0/1       1-4094
Gi0/2       20
Gi0/3       1-4094

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

Port        Vlans in spanning tree forwarding state and not pruned
Gi0/0       none
Gi0/1       none
Gi0/2       20
 --More--
```

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

PC 1 – 6 назначены ip 10.0.0.1 – 10.0.0.6.

```
🖥 Layer2Switch-4 - PuTTY                                                          —  □  ×
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

Checking for duplicate address...
PC1 : 10.0.0.1 255.255.255.0

PC1> show ip

NAME        : PC1[1]
IP/MASK     : 10.0.0.1/24
GATEWAY     : 0.0.0.0
DNS         :
MAC         : 00:50:79:66:68:04
LPORT       : 20108
RHOST:PORT  : 127.0.0.1:20109
MTU         : 1500

PC1> ping 10.0.0.2

host (10.0.0.2) not reachable

PC1> ping 10.0.0.3

84 bytes from 10.0.0.3 icmp_seq=1 ttl=64 time=11.410 ms
84 bytes from 10.0.0.3 icmp_seq=2 ttl=64 time=7.561 ms
84 bytes from 10.0.0.3 icmp_seq=3 ttl=64 time=10.679 ms
84 bytes from 10.0.0.3 icmp_seq=4 ttl=64 time=6.719 ms
84 bytes from 10.0.0.3 icmp_seq=5 ttl=64 time=7.052 ms

PC1> ping 10.0.0.4

host (10.0.0.4) not reachable

PC1> ping 10.0.0.5

84 bytes from 10.0.0.5 icmp_seq=1 ttl=64 time=6.746 ms
84 bytes from 10.0.0.5 icmp_seq=2 ttl=64 time=7.640 ms
84 bytes from 10.0.0.5 icmp_seq=3 ttl=64 time=1.864 ms
84 bytes from 10.0.0.5 icmp_seq=4 ttl=64 time=2.529 ms
84 bytes from 10.0.0.5 icmp_seq=5 ttl=64 time=5.090 ms

PC1> ping 10.0.0.6

host (10.0.0.6) not reachable

PC1>
```

```
🖥 Layer2Switch-4 - PuTTY                                                          —  □  ×
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

Checking for duplicate address...
PC2 : 10.0.0.2 255.255.255.0

PC2> show ip

NAME        : PC2[1]
IP/MASK     : 10.0.0.2/24
GATEWAY     : 0.0.0.0
DNS         :
MAC         : 00:50:79:66:68:01
LPORT       : 20122
RHOST:PORT  : 127.0.0.1:20123
MTU         : 1500

PC2> ping 10.0.0.1

host (10.0.0.1) not reachable

PC2> ping 10.0.0.3

host (10.0.0.3) not reachable

PC2> ping 10.0.0.4

84 bytes from 10.0.0.4 icmp_seq=1 ttl=64 time=6.470 ms
84 bytes from 10.0.0.4 icmp_seq=2 ttl=64 time=7.628 ms
84 bytes from 10.0.0.4 icmp_seq=3 ttl=64 time=4.158 ms
84 bytes from 10.0.0.4 icmp_seq=4 ttl=64 time=1.908 ms
84 bytes from 10.0.0.4 icmp_seq=5 ttl=64 time=3.405 ms

PC2> ping 10.0.0.5

host (10.0.0.5) not reachable

PC2> ping 10.0.0.6

84 bytes from 10.0.0.6 icmp_seq=1 ttl=64 time=13.125 ms
84 bytes from 10.0.0.6 icmp_seq=2 ttl=64 time=7.094 ms
84 bytes from 10.0.0.6 icmp_seq=3 ttl=64 time=9.399 ms
84 bytes from 10.0.0.6 icmp_seq=4 ttl=64 time=6.337 ms
84 bytes from 10.0.0.6 icmp_seq=5 ttl=64 time=1.931 ms

PC2>
```

```
Layer2Switch-4 - PuTTY
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file


Checking for duplicate address...
PC3 : 10.0.0.3 255.255.255.0

PC3> show ip

NAME         : PC3[1]
IP/MASK      : 10.0.0.3/24
GATEWAY      : 0.0.0.0
DNS          :
MAC          : 00:50:79:66:68:02
LPORT        : 20124
RHOST:PORT   : 127.0.0.1:20125
MTU          : 1500

PC3> ping 10.0.0.1

84 bytes from 10.0.0.1 icmp_seq=1 ttl=64 time=8.522 ms
84 bytes from 10.0.0.1 icmp_seq=2 ttl=64 time=5.276 ms
84 bytes from 10.0.0.1 icmp_seq=3 ttl=64 time=7.635 ms
84 bytes from 10.0.0.1 icmp_seq=4 ttl=64 time=8.299 ms
84 bytes from 10.0.0.1 icmp_seq=5 ttl=64 time=5.346 ms

PC3> ping 10.0.0.2

host (10.0.0.2) not reachable

PC3> ping 10.0.0.4

host (10.0.0.4) not reachable

PC3> ping 10.0.0.5

84 bytes from 10.0.0.5 icmp_seq=1 ttl=64 time=5.038 ms
84 bytes from 10.0.0.5 icmp_seq=2 ttl=64 time=8.457 ms
84 bytes from 10.0.0.5 icmp_seq=3 ttl=64 time=6.782 ms
84 bytes from 10.0.0.5 icmp_seq=4 ttl=64 time=7.187 ms
84 bytes from 10.0.0.5 icmp_seq=5 ttl=64 time=3.365 ms

PC3> ping 10.0.0.6

host (10.0.0.6) not reachable

PC3>
```



```
Layer2Switch-4 - PuTTY
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file


Checking for duplicate address...
PC4 : 10.0.0.4 255.255.255.0

PC4> show ip

NAME         : PC4[1]
IP/MASK      : 10.0.0.4/24
GATEWAY      : 0.0.0.0
DNS          :
MAC          : 00:50:79:66:68:05
LPORT        : 20126
RHOST:PORT   : 127.0.0.1:20127
MTU          : 1500

PC4> ping 10.0.0.1

host (10.0.0.1) not reachable

PC4> ping 10.0.0.2

84 bytes from 10.0.0.2 icmp_seq=1 ttl=64 time=2.641 ms
84 bytes from 10.0.0.2 icmp_seq=2 ttl=64 time=6.787 ms
84 bytes from 10.0.0.2 icmp_seq=3 ttl=64 time=10.029 ms
84 bytes from 10.0.0.2 icmp_seq=4 ttl=64 time=5.021 ms
84 bytes from 10.0.0.2 icmp_seq=5 ttl=64 time=9.679 ms

PC4> ping 10.0.0.3

host (10.0.0.3) not reachable

PC4> ping 10.0.0.5

host (10.0.0.5) not reachable

PC4> ping 10.0.0.6

84 bytes from 10.0.0.6 icmp_seq=1 ttl=64 time=8.275 ms
84 bytes from 10.0.0.6 icmp_seq=2 ttl=64 time=3.840 ms
84 bytes from 10.0.0.6 icmp_seq=3 ttl=64 time=7.424 ms
84 bytes from 10.0.0.6 icmp_seq=4 ttl=64 time=1.230 ms
84 bytes from 10.0.0.6 icmp_seq=5 ttl=64 time=2.003 ms

PC4>
```

Press '?' to get help.

Executing the startup file

Checking for duplicate address...
PC5 : 10.0.0.5 255.255.255.0

PC5> show ip

NAME   : PC5[1]
IP/MASK   : 10.0.0.5/24
GATEWAY   : 0.0.0.0
DNS   :
MAC   : 00:50:79:66:68:03
LPORT   : 20128
RHOST:PORT : 127.0.0.1:20129
MTU   : 1500

PC5> ping 10.0.0.1

84 bytes from 10.0.0.1 icmp_seq=1 ttl=64 time=9.988 ms
84 bytes from 10.0.0.1 icmp_seq=2 ttl=64 time=5.770 ms
84 bytes from 10.0.0.1 icmp_seq=3 ttl=64 time=7.585 ms
84 bytes from 10.0.0.1 icmp_seq=4 ttl=64 time=6.639 ms
84 bytes from 10.0.0.1 icmp_seq=5 ttl=64 time=7.619 ms

PC5> ping 10.0.0.2

host (10.0.0.2) not reachable

PC5> ping 10.0.0.3

84 bytes from 10.0.0.3 icmp_seq=1 ttl=64 time=6.101 ms
84 bytes from 10.0.0.3 icmp_seq=2 ttl=64 time=9.174 ms
84 bytes from 10.0.0.3 icmp_seq=3 ttl=64 time=6.534 ms
84 bytes from 10.0.0.3 icmp_seq=4 ttl=64 time=7.838 ms
84 bytes from 10.0.0.3 icmp_seq=5 ttl=64 time=6.172 ms

PC5> ping 10.0.0.4

host (10.0.0.4) not reachable

PC5> ping 10.0.0.6

host (10.0.0.6) not reachable

PC5>

Press '?' to get help.

Executing the startup file

Checking for duplicate address...
PC6 : 10.0.0.6 255.255.255.0

PC6> show ip

NAME   : PC6[1]
IP/MASK   : 10.0.0.6/24
GATEWAY   : 0.0.0.0
DNS   :
MAC   : 00:50:79:66:68:00
LPORT   : 20130
RHOST:PORT : 127.0.0.1:20131
MTU   : 1500

PC6> ping 10.0.0.1

host (10.0.0.1) not reachable

PC6> ping 10.0.0.2

84 bytes from 10.0.0.2 icmp_seq=1 ttl=64 time=3.637 ms
84 bytes from 10.0.0.2 icmp_seq=2 ttl=64 time=3.785 ms
84 bytes from 10.0.0.2 icmp_seq=3 ttl=64 time=3.268 ms
84 bytes from 10.0.0.2 icmp_seq=4 ttl=64 time=8.966 ms
84 bytes from 10.0.0.2 icmp_seq=5 ttl=64 time=8.457 ms

PC6> ping 10.0.0.3

host (10.0.0.3) not reachable

PC6> ping 10.0.0.4

84 bytes from 10.0.0.4 icmp_seq=1 ttl=64 time=5.731 ms
84 bytes from 10.0.0.4 icmp_seq=2 ttl=64 time=14.646 ms
84 bytes from 10.0.0.4 icmp_seq=3 ttl=64 time=6.767 ms
84 bytes from 10.0.0.4 icmp_seq=4 ttl=64 time=7.051 ms
84 bytes from 10.0.0.4 icmp_seq=5 ttl=64 time=14.220 ms

PC6> ping 10.0.0.5

host (10.0.0.5) not reachable

PC6>

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