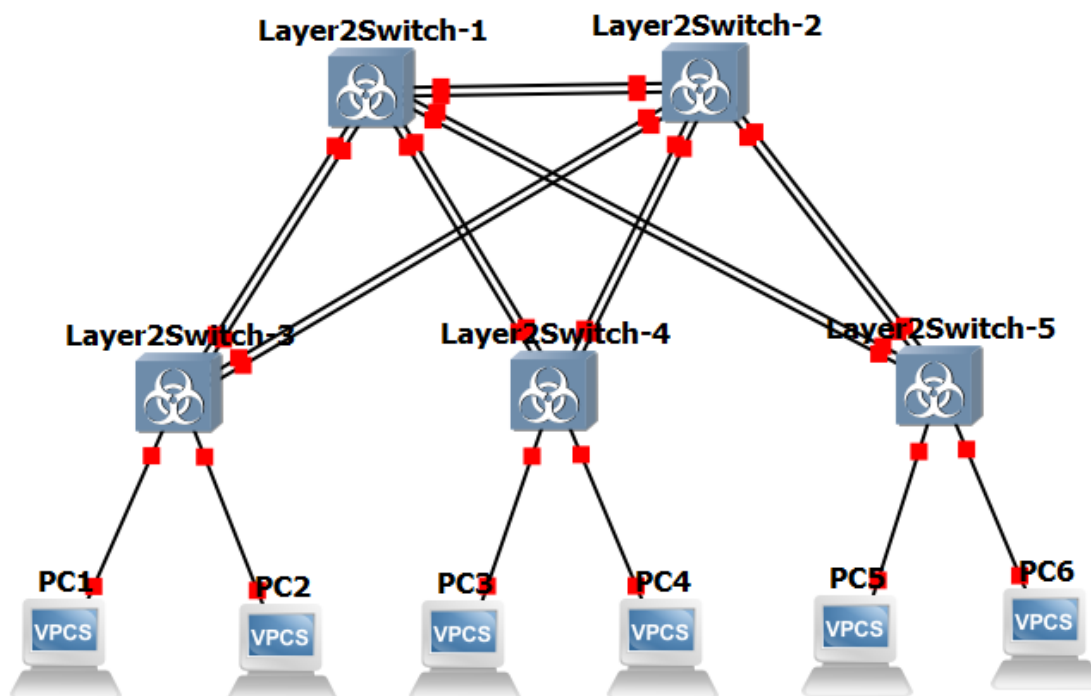


1. Для заданной на схеме lab2schema сети, состоящей из управляемых коммутаторов и персональных компьютеров настроить протокол STP, назначив явно один из коммутаторов корневым настройкой приоритета

Построена следующая схема:



Затем подключаемся к каждому коммутатору через консоль и активируем протокол STP, с помощью команд:

```
enable
configure terminal
spanning-tree mode pvst
```

```
vIOS-L2-01>enable
vIOS-L2-01#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
vIOS-L2-01(config)#spanning-tree mode pvst
vIOS-L2-01(config)#
```

Теперь необходимо выбрать коммутатор, который будет корневым и понизить его приоритет. Пусть корневым будет L2-SW-1. Откроем его консоль и вводим следующую команду:

```
spanning-tree vlan 1 priority 4096
```

```
vIOS-L2-01(config)#spanning-tree vlan 1 priority 4096
vIOS-L2-01(config)#
```

Для других коммутаторов необходимо тоже поставить приоритет, но выше, чем у корневого:

```
spanning-tree vlan 1 priority 8192
```

```
vIOS-L2-01(config)#spanning-tree vlan 1 priority 8192
vIOS-L2-01(config)#
```

Для проверки ролей интерфейса для каждого коммутатора можно использовать команду **show spanning-tree**.

Чтобы сохранить конфигурацию, вводим команду **write memory** на каждом коммутаторе.

```
vIOS-L2-01#write memory
Building configuration...
Compressed configuration from 5211 bytes to 1996 bytes[OK]
vIOS-L2-01#
*Aug 20 17:56:49.956: %GRUB-5-CONFIG_WRITING: GRUB configuration is being update
d on disk. Please wait...
*Aug 20 17:56:50.692: %GRUB-5-CONFIG_WRITTEN: GRUB configuration was written to
disk successfully.
vIOS-L2-01#
```

2. Проверить доступность каждого с каждым всех персональных компьютеров (VPCS), результаты запротоколировать

Для каждого компьютера назначим IP-адрес:

```
PC1> ip 192.168.1.1/24
PC2> ip 192.168.1.2/24
PC3> ip 192.168.1.3/24
PC4> ip 192.168.1.4/24
PC5> ip 192.168.1.5/24
PC6> ip 192.168.1.6/24
```

```
PC1> ip 192.168.1.1/24
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0
```

```
PC2> ip 192.168.1.2/24
Checking for duplicate address...
PC2 : 192.168.1.2 255.255.255.0
```

```
PC3> ip 192.168.1.3/24
Checking for duplicate address...
PC3 : 192.168.1.3 255.255.255.0
```

```
PC4> ip 192.168.1.4/24
Checking for duplicate address...
PC4 : 192.168.1.4 255.255.255.0
```

```
PC5> ip 192.168.1.5/24
Checking for duplicate address...
PC5 : 192.168.1.5 255.255.255.0
```

```
PC6> ip 192.168.1.6/24
Checking for duplicate address...
PC6 : 192.168.1.6 255.255.255.0
```

Теперь проверим доступность ПК. Из первого компьютера ping на IP-адрес третьего:

ping 192.168.1.3

```
PC1> ping 192.168.1.3

84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=9.634 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=7.941 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=64 time=6.607 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=64 time=7.887 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=64 time=5.137 ms
```

Из первого на IP пятого:

ping 192.168.1.5

```
PC1> ping 192.168.1.5

84 bytes from 192.168.1.5 icmp_seq=1 ttl=64 time=21.032 ms
84 bytes from 192.168.1.5 icmp_seq=2 ttl=64 time=2.307 ms
84 bytes from 192.168.1.5 icmp_seq=3 ttl=64 time=6.618 ms
84 bytes from 192.168.1.5 icmp_seq=4 ttl=64 time=6.383 ms
84 bytes from 192.168.1.5 icmp_seq=5 ttl=64 time=11.344 ms
```

3. На изображении схемы отметить BID каждого коммутатора и режимы работы портов (RP/DP/blocked) и стоимости маршрутов, результат сохранить в файл

На каждом коммутаторе вводим команду **show spanning-tree**, после чего отобразится следующая информация (в данном случае взят третий коммутатор):

```
vIOS-L2-01#show spanning-tree

VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    4097
             Address     0c70.295f.0000
             Cost        4
             Port        1 (GigabitEthernet0/0)
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    8193  (priority 8192 sys-id-ext 1)
             Address     0ce1.fdfd.0000
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time   300 sec

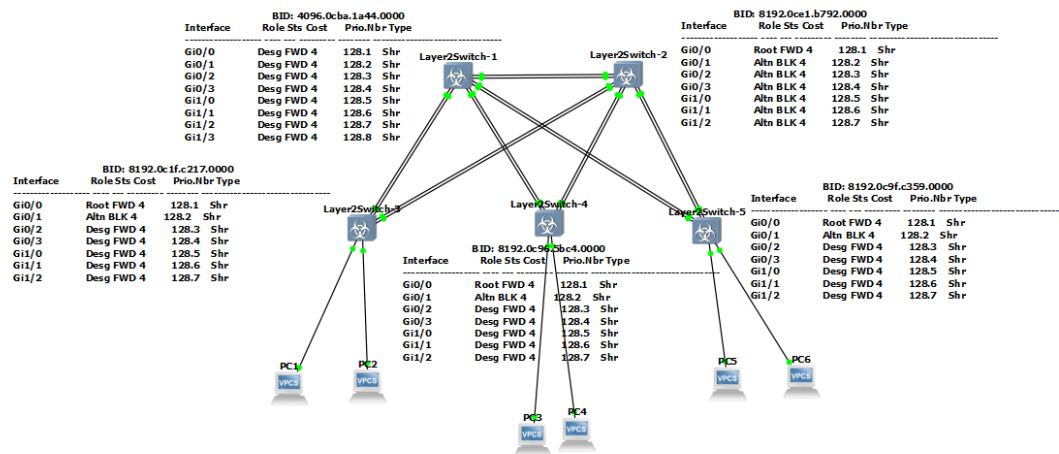
Interface Role Sts Cost Prio.Nbr Type
-----
Gi0/0     Root FWD 4     128.1 Shr
Gi0/1     Altn BLK 4     128.2 Shr
Gi0/2     Altn BLK 4     128.3 Shr
Gi0/3     Altn BLK 4     128.4 Shr
Gi1/0     Desg FWD 4     128.5 Shr
Gi1/1     Desg FWD 4     128.6 Shr
Gi1/2     Desg FWD 4     128.7 Shr
--More--
```

Нам необходимы следующие две строки:

```
Bridge ID  Priority    8193  (priority 8192 sys-id-ext 1)
Address     0ce1.fdfd.0000
```

Тогда для третьего коммутатора BID следующий: **8192.0ce1.fdfd.0000**.

Для каждого коммутатора отобразим его BID на схеме и получим следующее:



- При помощи wireshark отследить передачу пакетов hello от корневого коммутатора на всех линках (nb!), результаты включить в отчет

### SW-1 и SW-3

Захват из Standard input [Layer2Switch-1 Ethernet2 to Layer2Switch-3 Ethernet0]						
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка						
stp						
Time	Source	Destination	Protocol	Length	Info	
1 0.000000	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
2 0.823971	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
3 0.828922	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
4 0.833353	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
6 0.990416	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
7 1.005411	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
8 1.007838	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
9 1.022413	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
10 2.015871	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
11 2.836090	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
12 2.841643	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
13 2.844028	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
15 2.998118	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
16 3.013238	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
17 3.018594	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
18 3.030080	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
19 4.028364	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
21 4.850937	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
22 4.854662	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
23 4.857408	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
24 5.010803	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
25 5.026357	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
26 5.033604	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
27 5.043906	0c:1f:c2:17:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:1f:c2:17:00:00	Cost = 0 Port = 0x8001
28 6.037066	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
29 6.862407	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
30 6.867305	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003
31 6.870934	0c:ba:1a:44:00:02	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0 Port = 0x8003

SW-1 u SW-2

Захват из Standard input [Layer2Switch-1 Ethernet0 to Layer2Switch-2 Ethernet0]

ФайлПравкаВидЗапускЗахватАнализСтатистикаТелефонияБеспроводная связьИнструментыСправка

stp

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
2	1.005868	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
3	1.088224	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
4	1.097222	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
5	1.118208	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
6	1.228823	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
7	1.232097	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
8	1.254314	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
10	2.013695	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
11	3.019529	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
12	3.107900	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
13	3.120909	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
14	3.138138	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
15	3.239819	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
16	3.242757	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
17	3.265470	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
18	4.027476	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
19	5.035228	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
20	5.136568	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
21	5.147889	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
22	5.164563	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
23	5.257514	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
24	5.260726	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
25	5.283160	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
26	6.049117	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
27	7.065519	0c:ba:1a:44:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8001
28	7.170284	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001
29	7.180261	0c:e1:b7:92:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:e1:b7:92:00:00 Cost = 0 Port = 0x8001

SW-1 u SW-4

Захват из Standard input [Layer2Switch-1 Ethernet4 to Layer2Switch-4 Ethernet0]

ФайлПравкаВидЗапускЗахватАнализСтатистикаТелефонияБеспроводная связьИнструментыСправка

stp

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
2	0.012055	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
3	0.028815	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
4	0.829517	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
5	1.693078	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
6	1.712884	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
7	1.737883	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
8	1.836374	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
9	2.012598	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
10	2.025787	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
11	2.041860	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
12	2.848219	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
13	3.708635	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
14	3.727944	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
15	3.750643	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
16	3.852058	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
17	4.026233	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
18	4.037858	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
19	4.054126	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
20	4.854911	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
22	5.723334	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
23	5.742869	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
24	5.765628	0c:96:5b:c4:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:96:5b:c4:00:00 Cost = 0 Port = 0x8001
25	5.864745	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
26	6.040011	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/100/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
27	6.052945	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/200/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
28	6.069505	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 32768/300/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005
29	6.871600	0c:ba:1a:44:00:04	Spanning-tree-(for-bridges)_00	STP	60	Conf. Root = 4096/1/0c:ba:1a:44:00:00 Cost = 0 Port = 0x8005

SW-1 u SW-5

Захват из Standard input [Layer2Switch-1 Ethernet6 to Layer2Switch-5 Ethernet0]									
Файл Правка Вид Запуск Захват Анализ Статистика Телефония Беспроводная связь Инструменты Справка									
stp									
No.	Time	Source	Destination	Protocol	Length	Info			
1	0.000000	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
2	0.001945	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
3	0.005948	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
4	0.781406	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
5	0.782384	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
6	0.793221	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
7	0.812257	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
8	1.797024	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
9	2.028030	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
10	2.031030	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
11	2.034723	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
13	2.810158	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
14	2.810894	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
15	2.821759	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
16	2.840986	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
17	3.820864	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
18	4.044374	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
19	4.046336	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
20	4.050311	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
21	4.832566	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
22	4.833578	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
23	4.844518	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
24	4.863444	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
26	5.841875	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 4096/1/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007
27	6.073414	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
28	6.075053	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/200/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
29	6.079403	0c:9f:c3:59:00:00	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/300/0c:9f:c3:59:00:00	Cost = 0	Port = 0x8001
30	6.845776	0c:ba:1a:44:00:06	Spanning-tree-(for-bridges)_00	STP	60	Conf.	Root = 32768/100/0c:ba:1a:44:00:00	Cost = 0	Port = 0x8007



- Изменить стоимость маршрута для порта RP произвольного назначенного (designated) коммутатора, повторить действия из п.3, результат сохранить в отдельный файл

В третьем коммутаторе изменим стоимость маршрута для порта RP:

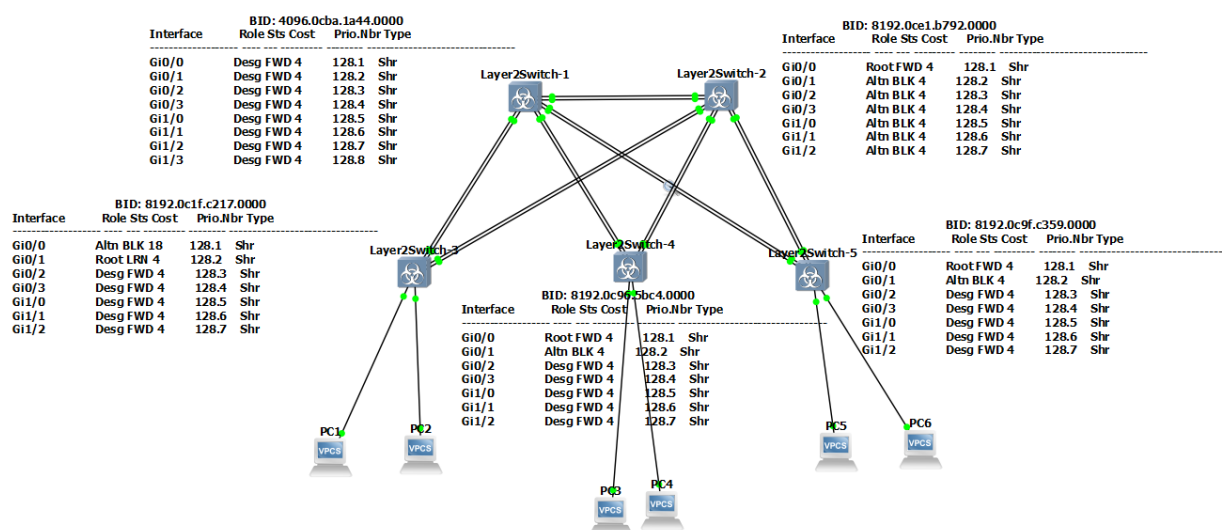
**configure terminal**

**interface GigabitEthernet0/0**

**spanning-tree vlan 1 cost 18**

```
vIOS-L2-01#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
vIOS-L2-01(config)#interface GigabitEthernet0/0
vIOS-L2-01(config-if)#spanning-tree vlan 1 cost 18
vIOS-L2-01(config-if)#
```

Добавим изменения в схему и получим следующее:



Обратим внимание, что изменения коснулись лишь третьего коммутатора, где была изменена стоимость маршрута. Теперь порты изменили своё назначение. RP-портом стал Gi0/1.

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

На каждом коммутаторе выполняем следующие команды:

**enable**

**copy running-config startup-config**

```
vIOS-L2-01>enable
vIOS-L2-01#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
Compressed configuration from 5211 bytes to 2001 bytes[OK]
vIOS-L2-01#
*Aug 28 17:46:13.621: %GRUB-5-CONFIG_WRITING: GRUB configuration is being update
d on disk. Please wait...
*Aug 28 17:46:14.363: %GRUB-5-CONFIG_WRITTEN: GRUB configuration was written to
disk successfully.
vIOS-L2-01#
```

7. Опциональное задание: заменить STP на RSTP (IEEE 802.1w), повторить 1-6, отметить резервные порты в п.3 и п.5, отличие работы протокола RSTP от протокола STP в п.4