ОТЧЁТ

Лабораторная работа №2

“ Настройка протокола STP (IEEE 802.1D)”

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Ход работы

1. Для заданной на схеме schema-lab2 сети, состоящей из управляемых коммутаторов и персональных компьютеров

настроить протокол STP, назначив явно один из коммутаторов корневым настройкой приоритета

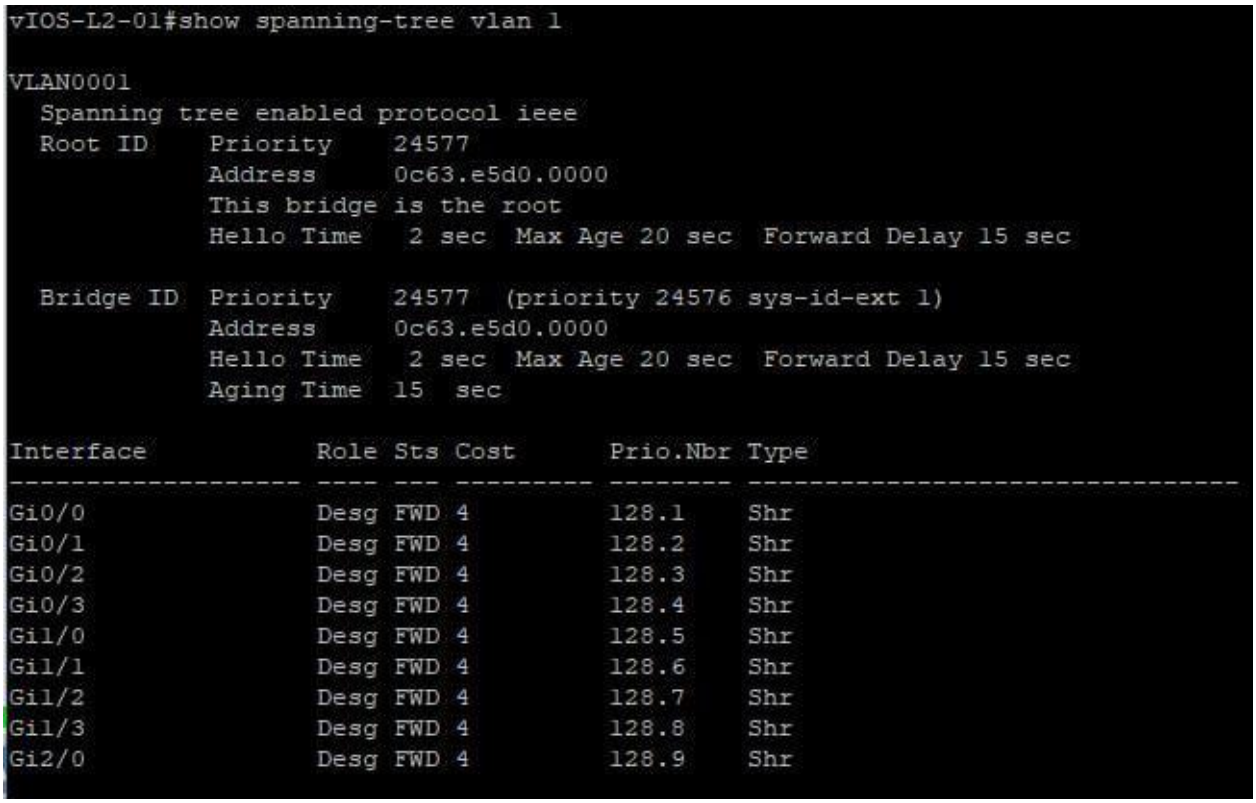
enable

configure terminal

spanning-tree vlan 1 root primary

end

show spanning-tree vlan 1



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

Настраиваем ip адреса у коммутаторов и VPCS

enable

configure terminal

interface vlan 1

ip address 192.168.1.11 255.255.255.0 //11-15

no shutdown

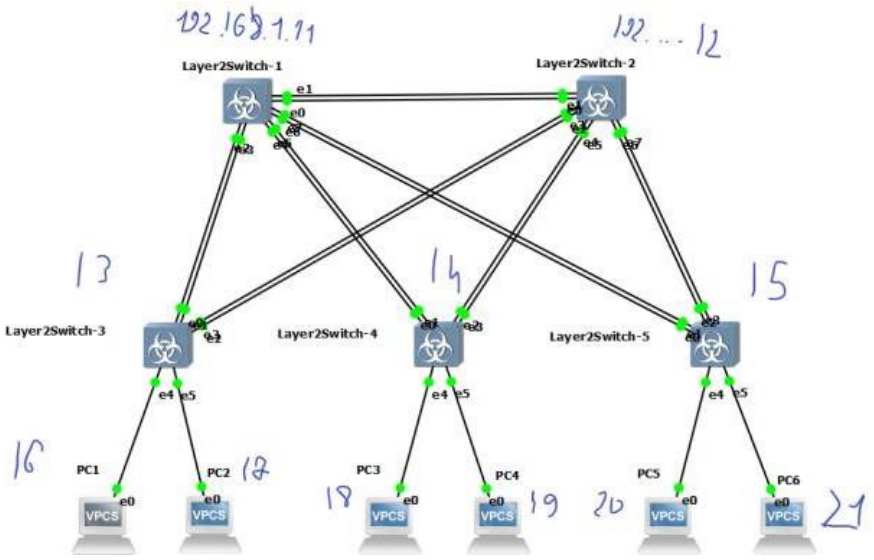
exit

exit

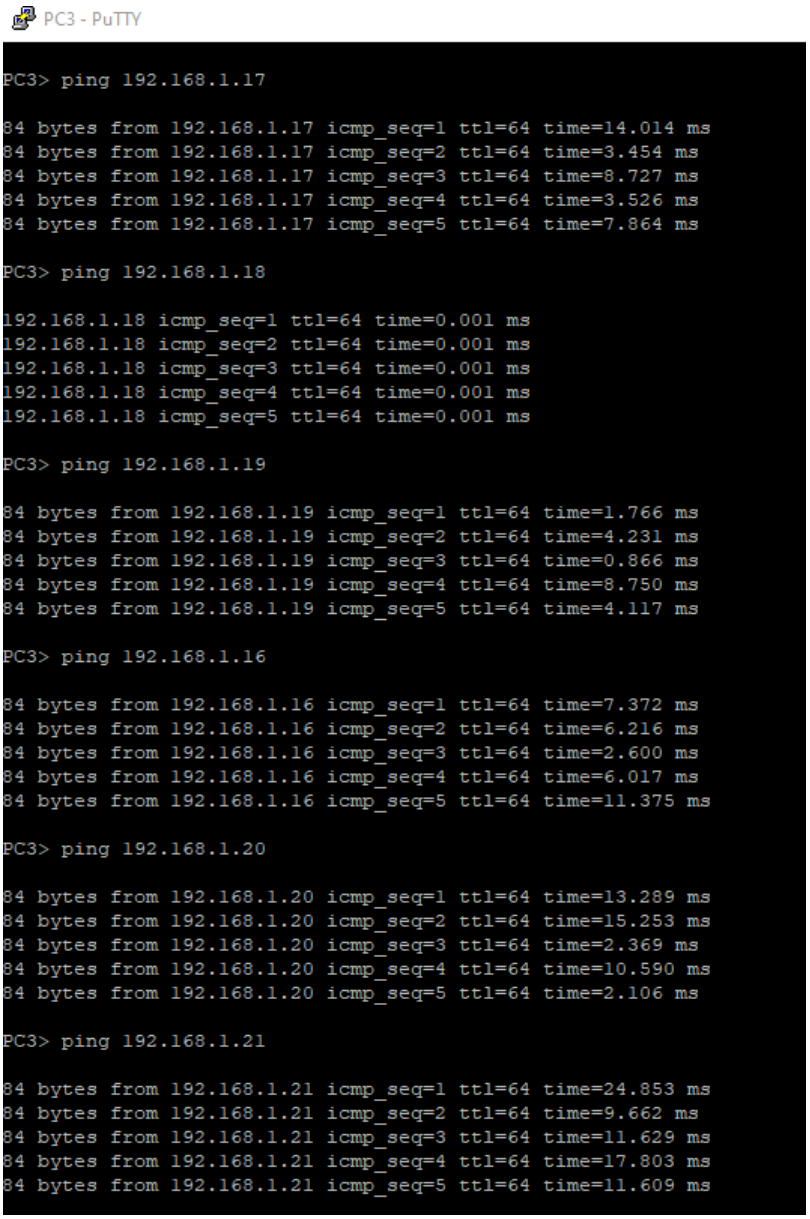
copy running-config startup-config

ip 192.168.1.16 255.255.255.0 192.168.1.13 //16-21

save



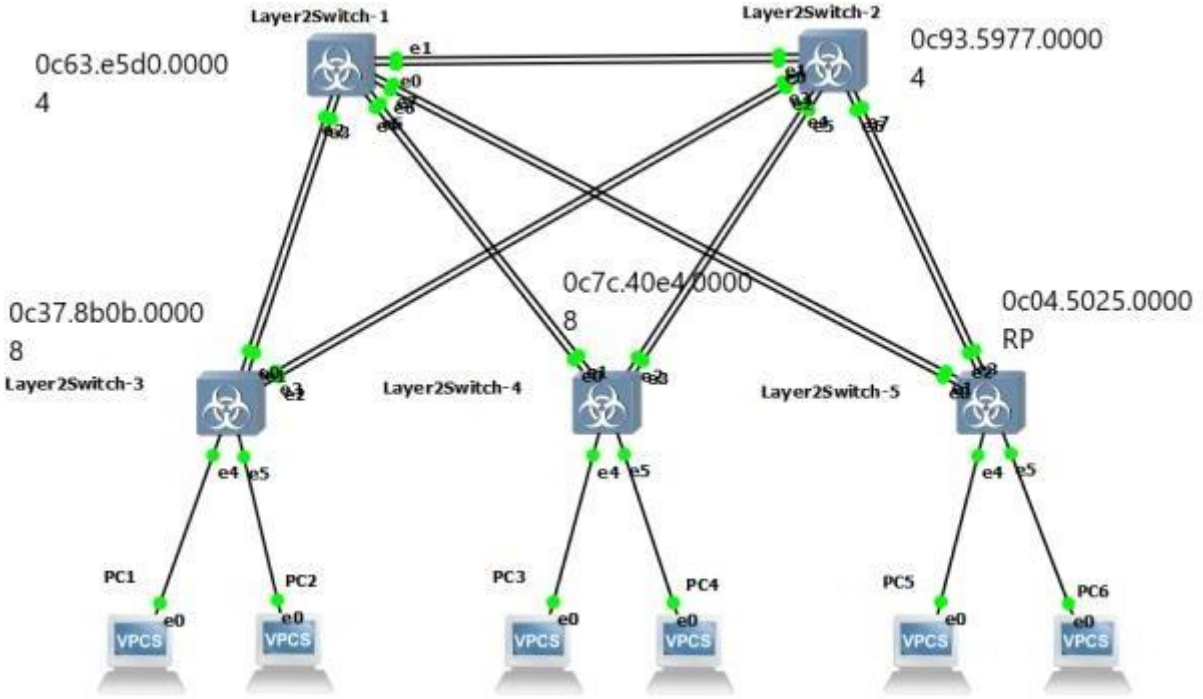
ping 192.168.1.16 //16-21



Как видим пакеты доставляются ко всем VPCS

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

show spanning-tree vlan 1



y Layer2Switch-1

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi0/0	Desg	FWD	4	128.1	Shr
Gi0/1	Desg	FWD	4	128.2	Shr
Gi0/2	Desg	FWD	4	128.3	Shr
Gi0/3	Desg	FWD	4	128.4	Shr
Gi1/0	Desg	FWD	4	128.5	Shr
Gi1/1	Desg	FWD	4	128.6	Shr
Gi1/2	Root	FWD	4	128.7	Shr
Gi1/3	Altn	BLK	4	128.8	Shr
Gi2/0	Desg	FWD	4	128.9	Shr

y Layer2Switch-2

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi0/0	Altn	BLK	4	128.1	Shr
Gi0/1	Altn	BLK	4	128.2	Shr
Gi0/2	Desg	FWD	4	128.3	Shr
Gi0/3	Desg	FWD	4	128.4	Shr
Gi1/0	Desg	FWD	4	128.5	Shr
Gi1/1	Desg	FWD	4	128.6	Shr
Gi1/2	Root	FWD	4	128.7	Shr
Gi1/3	Altn	BLK	4	128.8	Shr
Gi2/0	Desg	FWD	4	128.9	Shr

y Layer2Switch-3

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

y Layer2Switch-4

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

y Layer2Switch-5

Interface	Role Sts Cost	Prio.Nbr	Type
Gi0/0	Desg FWD 4	128.1	Shr
Gi0/1	Desg FWD 4	128.2	Shr
Gi0/2	Desg FWD 4	128.3	Shr
Gi0/3	Desg FWD 4	128.4	Shr
Gi1/0	Desg FWD 4	128.5	Shr
Gi1/1	Desg FWD 4	128.6	Shr

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

14 2.989775	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
15 2.994921	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
16 3.089871	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
17 3.093174	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
18 4.090076	0c:93:59:77:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:93:59:77:00:00 Cost = 0 Port = 0x8008
19 4.093615	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
20 4.109115	0c:93:59:77:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:93:59:77:00:00 Cost = 0 Port = 0x8008
21 4.553149	0c:93:59:77:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:93:59:77:00:00 Cost = 0 Port = 0x8008
22 4.992317	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
23 4.997377	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
24 5.092592	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
25 5.095372	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
26 5.100596	0c:93:59:77:00:07	0c:93:59:77:00:07	LOOP	60	Reply
27 6.138711	0c:93:59:77:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:93:59:77:00:00 Cost = 0 Port = 0x8008
28 6.139258	0c:04:50:25:00:03	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8004
29 6.156935	0c:93:59:77:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:93:59:77:00:00 Cost = 0 Port = 0x8008

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:93:59:77:00:00 Cost = 0 Port = 0x8007
2	0.022317	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:93:59:77:00:00 Cost = 0 Port = 0x8007
3	0.459680	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:93:59:77:00:00 Cost = 0 Port = 0x8007
4	0.715975	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
5	1.609913	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
6	1.614874	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
7	1.710837	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
8	1.715819	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
9	2.045518	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:93:59:77:00:00 Cost = 0 Port = 0x8007
10	2.069573	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:93:59:77:00:00 Cost = 0 Port = 0x8007
11	2.509932	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:93:59:77:00:00 Cost = 0 Port = 0x8007
12	2.715705	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
13	3.609552	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
14	3.614575	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
15	3.710587	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
16	3.715509	0c:04:50:25:00:02	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8003
17	4.054466	0c:04:50:25:00:02	CDP/VTP/DTP/PAgP/UD…	DTP	62	Dynamic Trunk Protocol
18	4.095240	0c:93:59:77:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:93:59:77:00:00 Cost = 0 Port = 0x8007

До Switch-2

No.	Time	Source	Destination	Protocol	Lengtl	Info
1	0.000000	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
2	0.004915	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
3	0.098301	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
4	0.099053	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
5	0.100929	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
6	0.103877	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
7	0.116224	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
8	0.510884	0c:04:50:25:00:01	0c:04:50:25:00:01	LOOP	60	Reply
9	1.103877	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
10	2.004829	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
11	2.009586	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
12	2.105719	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
13	2.111664	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
14	2.154240	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
15	2.158249	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
16	2.173115	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
17	3.113864	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
18	3.430454	0c:04:50:25:00:01	CDP/VTP/DTP/PAgP/UD…	CDP	449	Device ID: vIOS-L2-01 Port ID: GigabitEthernet0/1
19	4.009388	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
20	4.014343	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
21	4.111444	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
22	4.118966	0c:04:50:25:00:01	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8002
23	4.188384	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
24	4.193917	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008
25	4.207689	0c:63:e5:d0:00:07	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8008

1	0.000000	0c:63:e5:d0:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8007
2	0.000762	0c:04:50:25:00:00	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8001
3	0.008085	0c:63:e5:d0:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8007
4	0.022827	0c:63:e5:d0:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8007
5	0.892182	0c:04:50:25:00:00	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:04:50:25:00:00 Cost = 0 Port = 0x8001
6	0.897332	0c:04:50:25:00:00	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:04:50:25:00:00 Cost = 0 Port = 0x8001
7	0.993179	0c:04:50:25:00:00	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:04:50:25:00:00 Cost = 0 Port = 0x8001
8	1.002208	0c:04:50:25:00:00	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8001
9	1.230213	0c:63:e5:d0:00:06	CDP/VTP/DTP/PAgP/UD…	DTP	62	Dynamic Trunk Protocol
10	1.698880	0c:63:e5:d0:00:06	0c:63:e5:d0:00:06	LOOP	60	Reply
11	2.048909	0c:63:e5:d0:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/100/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8007
12	2.049419	0c:04:50:25:00:00	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8001
13	2.056927	0c:63:e5:d0:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/200/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8007
14	2.070491	0c:63:e5:d0:00:06	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/300/0c:63:e5:d0:00:00 Cost = 0 Port = 0x8007

До Switch-5

1	0.000000	0c:04:50:25:00:04	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8005
2	2.000469	0c:04:50:25:00:04	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8005
3	4.003427	0c:04:50:25:00:04	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8005
4	6.006103	0c:04:50:25:00:04	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8005
5	6.410307	0c:04:50:25:00:04	0c:04:50:25:00:04	LOOP	60	Reply

До PC 5

1	0.000000	0c:04:50:25:00:05	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8006
2	1.999625	0c:04:50:25:00:05	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8006
3	2.404849	0c:04:50:25:00:05	0c:04:50:25:00:05	LOOP	60	Reply
4	4.000353	0c:04:50:25:00:05	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8006
5	6.015303	0c:04:50:25:00:05	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8006
6	7.487754	0c:04:50:25:00:05	CDP/VTP/DTP/PAgP/UD…	CDP	455	Device ID: vIOS-L2-01 Port ID: GigabitEthernet1/1
7	8.015733	0c:04:50:25:00:05	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8006
8	10.018420	0c:04:50:25:00:05	Nearest-Customer-Br…	STP	60	Conf. Root = 32768/1/0c:04:50:25:00:00 Cost = 0 Port = 0x8006

До PC 6

Как видим везде COST = 0 из-за прослушивания портов с корневого коммутатора.

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

enable

configure terminal

int gi1/2

spanning-tree vlan 1 cost 15

end

copy running-config startup-config

y Layer2Switch-1

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi0/0	Desg	FWD	4	128.1	Shr
Gi0/1	Desg	FWD	4	128.2	Shr
Gi0/2	Desg	FWD	4	128.3	Shr
Gi0/3	Desg	FWD	4	128.4	Shr
Gi1/0	Desg	FWD	4	128.5	Shr
Gi1/1	Desg	FWD	4	128.6	Shr
Gi1/2	Root	FWD	4	128.7	Shr
Gi1/3	Altn	BLK	4	128.8	Shr
Gi2/0	Desg	FWD	4	128.9	Shr

y Layer2Switch-2

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi0/0	Altn	BLK	4	128.1	Shr
Gi0/1	Altn	BLK	4	128.2	Shr
Gi0/2	Desg	FWD	4	128.3	Shr
Gi0/3	Desg	FWD	4	128.4	Shr
Gi1/0	Desg	FWD	4	128.5	Shr
Gi1/1	Desg	FWD	4	128.6	Shr
Gi1/2	Altn	BLK	15	128.7	Shr

Gi1/3 Root FWD 4 128.8 Shr

Gi2/0 Desg FWD 4 128.9 Shr

y Layer2Switch-3

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

y Layer2Switch-4

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

y Layer2Switch-5

Interface Role Sts Cost Prio.Nbr Type

Gi0/0 Desg FWD 4 128.1 Shr

Gi0/1 Desg FWD 4 128.2 Shr

Gi0/2 Desg FWD 4 128.3 Shr

Gi0/3	Desg FWD 4	128.4	Shr
Gi1/0	Desg FWD 4	128.5	Shr
Gi1/1	Desg FWD 4	128.6	Shr

Как видим, после изменения стоимости у Layer2Switch-2 роль порта до корневого коммутатора перешла другому порту из-за более выгодной стоимости маршрута.

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

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