Lab 14

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Task1:

If we check unconnected switches we will have bid information if we use show spanning-tree command:

S_1: 000C.85C4.2176

S_2: 00D0.BC59.2181

S_3: 000D.BDEC.784B

And they all have same VLAN priority: 32769

All the port costs are 19

All port priorities are 128

So S_1 should be the root bridge, because it's bid address is the lowest

Now the root ports:

Because there are two links with the same cost for both S2 and S3, we have to use tie brakers:

Neighbors bid – same

Neighbors port priority – same

Neighbor port number – makes difference:

For S_2: fa0/3 is the root port

For S_3: fa0/13 is the root port

Now – designated ports:

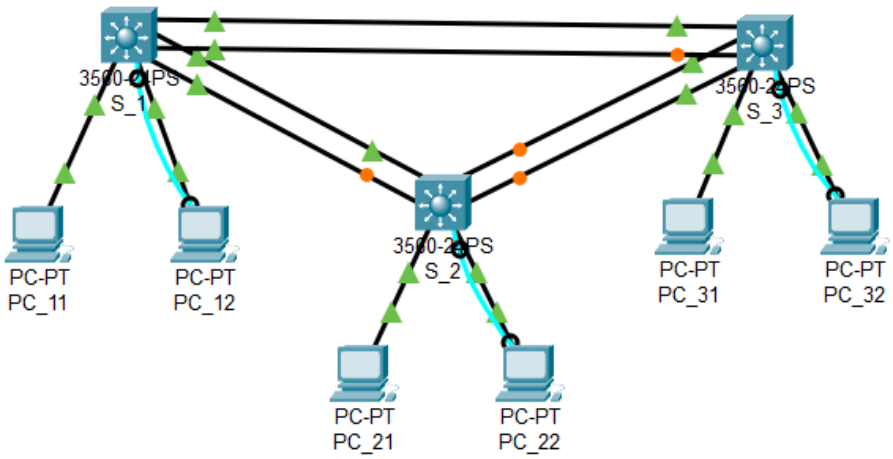
So on S_1 we have designated ports on fa0/3 and fa0/13 – ones connected to route ports on S_2 and S_3 accordingly.

On links fa0/5 and fa0/15 S_1 has designated ports aswell because the cost to the root is 0

And in connections between S_2 and S_3 ports of S_3 are designated, because the path cost is same and the next tie braker is bid which is lower for S_3, so it get's the designated ports.

Blocked ports:

All the rest non-mentioned ports are left blocked or alternative.



Swapping cables:

If we swap the cables connected to the f0/3 and f0/5 of S_2 the ports will act accordingly:

Now the root port on S_2 is fa0/5 because it has the lowest neighbor por number – 3 and fa0/3 on S_1 is designated port.

Fa0/5 on S_1 is designated because it has lowest (0) path cost and fa0/3 on S_2 is blocked.

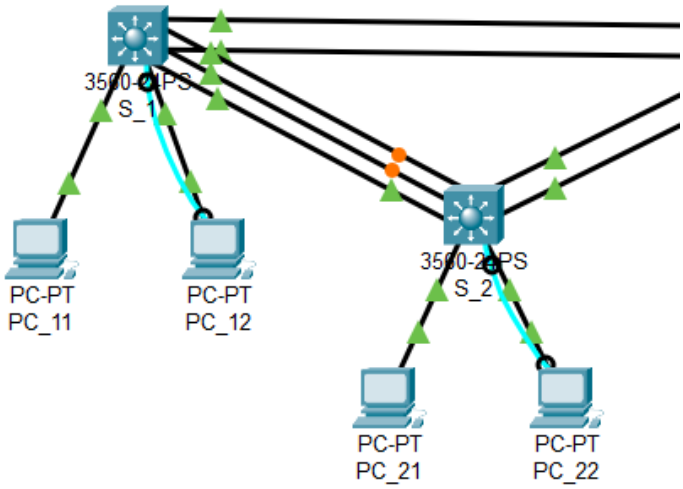
Changing cost:

Because the blocked port fa0/5 has the lower cost, which is the first tie braker, it is chosen to be root and the other fa0/3 – blocked now.

Faster port:

Because gigabit ethernet is a faster port It has a lower cost and therefore becomes a root port.

Other ports on the S_2 connected to S_1 – blocked



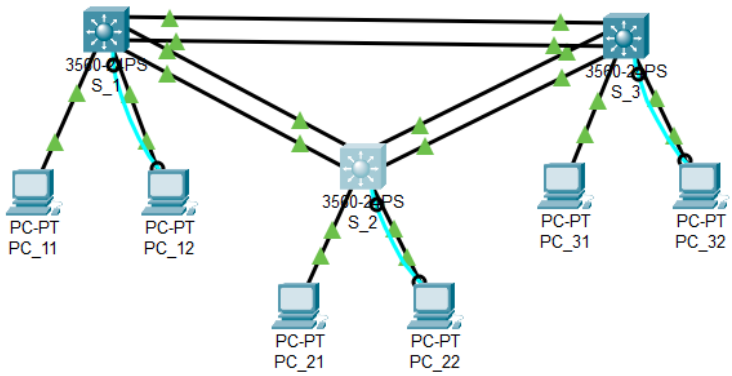
Gi to Fa:

If we connect Gigabit ethernet to Fast ethernet – port cost becomes 19 on both sides, because the bandwidth of the link is determined by the slower port.

So in fact fa0/3 is still a root port because it's neighbor port number – 3 is the smallest.

Task 2

If we configure everything correctly in task 2 we will see that every connection is lit up in green



That's because we have different spanning trees for each vlan, so there's no common blocked port, they could be all in multiple status and have multiple roles depending on the vlan.

With the **spanning-tree vlan1 root primary** – the priority becomes 24577 which is 2*4096 smaller than the original default priority. The reason for considering **2***4096 is that 4096 is the smallest step for changing the priority, and it's increasing the priority by two smallest steps(increasing priority – decreasing it's value).

The command **spanning-tree vlan1 root secondary** – decreases by 4096 – one default step.

Also the priorities on each vlan differ a bit because the vlan number is added to them.

Taks 3

If we disconnect a cable and then plug it back it would take 30 seconds until the link becomes usable – 15 seconds for listening stage and 15 seconds for learning stage.

```
Forward Delay 15 sec
```

Ping loss:

```
Pinging 192.168.0.19 with 32 bytes of data:

Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=2ms TTL=255
Reply from 192.168.0.19: bytes=32 time=5ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=29ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 192.168.0.19: bytes=32 time=22ms TTL=255
Reply from 192.168.0.19: bytes=32 time=1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=15ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
```

On access port:

Same 30 seconds for access port and same ping loss:

```
Pinging 192.168.0.22 with 32 bytes of data:

Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time=1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128
Reply from 192.168.0.22: bytes=32 time=19ms TTL=128
Reply from 192.168.0.22: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.0.22:
```

Rapid-pvst

In case with rapid-pvst configured, the connection is restored almost instantly and there is no ping loss occurring.

```
Reply from 192.168.0.19: bytes=32 time=2ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=3ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=10ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=3ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time=1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
Reply from 192.168.0.19: bytes=32 time<1ms TTL=255
```

The convergence time is maybe less than 1 second, for access ports – instant.