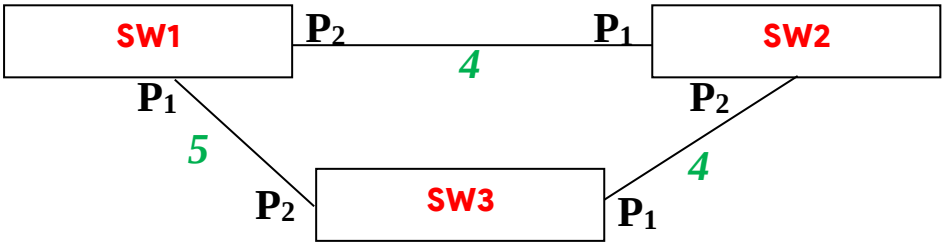
STP
Spanning Tree Protocol

- **STP** is used to reduce the effect of the broadcast frames in LAN networks.
  - Block some ports on switches to prevent the broadcast frames to move in two opposite directions
  - Make the propagation of the broadcast frame in one way only and prevent it in the reverse way.

Example:

- Assume three switches in a LAN network are connected in triangular form as shown :
- The costs of the links between switches are shown in the figure.



	MAC addresses
SW1	00ff:ffff:ffff
SW2	000f:ffff:ffff
SW3	0fff:ffff:ffff

Note:

- **If no STP protocol is applied to this network,**
  - The broadcast frame will propagat in clockwise and anticlockwise (2 opposite directions)
  - Which causes bad performance of the network due to the broadcast storm,

- **In the STP protocol we must assign the following**

Root switch	• **The switch which control how the STP operates.** • **It is elected as the lowest MAC address.** - root switch will be SW2 (from the table). - As SW2 is the root switch so its ports must be always open (forward) - P1/SW2 and P2/SW2
Root ports	• **The root ports are the facing port to the root switches on the other Switches** - P1/SW3 and P2/SW1 ports must be always open (forward)
Designated Blocking port	• **The designated port is an open (forward) port but not directly connected to the root switch.** - We still have two ports not assigned if forward (open) or blocked (closed). - These two ports are: P1/SW1 and P2/SW3. • **To choose the designated port** 1. We take the port who has the less costs to the root switch SW2. - In this case the costs are equal 4+5 = 9 2. Assign the port on the less MAC address between the switches on the link(SW1,SW3). - MAC address of SW1 **<** MAC address of SW3 - The port on SW1 (P1/SW1) will be the designated port and P2/SW3 is the blocked port.

- **We can brief the functions of the port in STP in the following table**

P1/SW1	Designated port	forward
P2/SW1	root port	forward
P1/SW2	port on root switch	forward
P2/SW2	port on root switch	forward
P1/SW3	root port	forward
P2/SW3	Blocking port	blocking