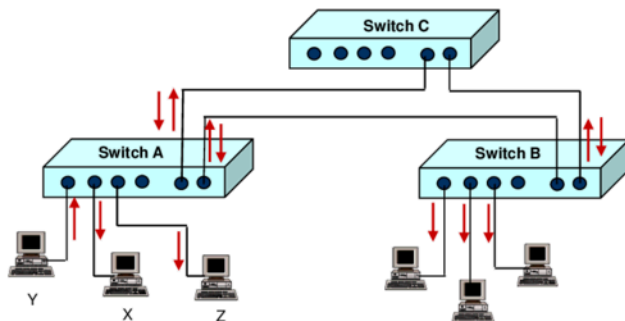- In **networks** with **closed loops** we have the *broadcast storm*, which corresponds to having a **frame that replicates exponentially**.

Assume that address Z is not in the SAT of switch A, and that station Y sends one frame to Z. As the consequence *switch* A broadcasts this frame to all ports except the incoming one. The *switchs* B e C receive the frame and broadcasts it also to all ports with the exception of the incoming ones. One arrives to a situation where the replications are almost exponential which can consume most of the bandwidth resources of the network, which contributes do degrade the network performance.

- **Another problem with closed loops lies on the fact that a station can be reached though multiple paths which is a source of confusion** for the forward and learning logic.

To solve these problems it is necessary to implement a spanning tree in the network graph.

A spanning tree of an undirected graph *G* is a sub-graph that is a tree with no cycles which includes all the vertices (nodes) of G.