

# Assignment 1

Sabyasachee Baruah  
12CS30029

Dhruv Jain  
12CS30043

Dharmana Prudhvi  
12CS10037

Swapnil Agarwal  
12CS10052

January 28, 2016

Spanning Tree Protocol is a layer 2 packet forwarding protocol that prevents physical loops. In layer 3 IP Protocol, IP packets have a designated field called TTL that discards old packets once the value decrements to zero. However there is no such thing in layer 2. Thus packets sent to a network of redundant switches will continue circulating in the network, eventually resulting in network failure. Spanning Tree Protocol elects a root bridge, calculates cost from each switch to the root bridge for different paths, declares the ports connecting the non root switches to the root switch via the least cost path as designated and the other ports as non designated. Traffic is routed through the designated ports. The alternate paths are used only in case of primary link failure.

When STP is enabled, the ports connecting switch  $s1$  and  $s2$  are designated ports and the ports in switch  $s3$  are non designated as the direct path from  $s1$  to  $s2$  incurs less cost than the path from  $s1$  to  $s2$  via  $s3$ . Thus packets sent from 10.0.10.2 to 10.0.10.1 first are captured at  $s2$  which forwards it to  $s1$ , not using the link connecting it to  $s3$ . The *UDP* packets are captured twice, once at  $s2$  and then at  $s1$ , and similarly the echo packet from 10.0.10.1 to 10.0.10.2 is first captured at  $s1$  and then at  $s2$ , finally reaching the destination 10.0.10.2.

When STP is disabled, we observe a crash after starting the simulation. This is self explanatory as the *UDP* packets are being continuously forwarded and new copies are made every time it reaches a switch. The newly generated packets ultimately eat up the entire bandwidth, making the network unable to receive any new packets resulting in failure. We also observe a lot of *ARP* requests that circulate the network.