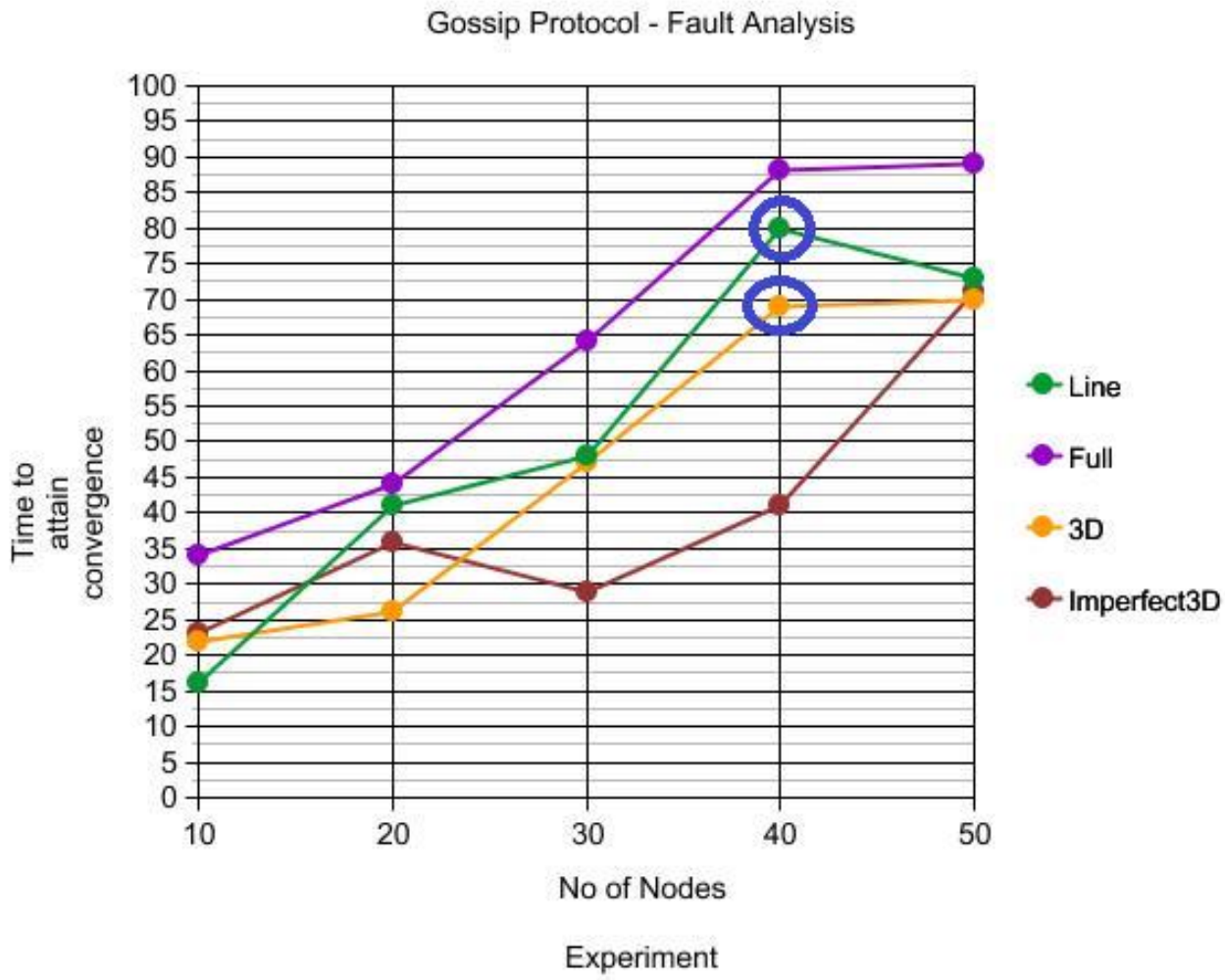
Faulty Node analysis – Gossip Algorithm

Implementation: In the code we have made handling for input from user to pass a 4th parameter known as the frequency. This frequency defines the interval at which a faulty node may be found in a given set of node. Example , Suppose there are 100 nodes and frequency is 10, this means that there will be a faulty node at an interval of 10 nodes i.e. 10th , 20th , 30th … are faulty nodes.

Experiment: Based on the frequency of nodes passed a parameter we terminate the node at those interval, and try to analyze if convergence is achieved or not. We compare the times taken for converging cases for different topologies and plot graph for the same.



Observation: We observed with the above experiment that the time to achieve convergence increased gradually by increasing the number of node in multiple of 10 and keeping the frequency constant at 10. This trend seems to occur for almost all topologies. At node 40 marked in blue for both line and full topology, we observed that rumor was passed for some time (3d-69 ms, line-80ms) but convergence took forever hence highlighted. That is not complete convergence is not achieved. This is plausibly due to certain nodes not being reachable as the faulty nodes are unable to forward messages further.