COT 5614 FALL 2015

Distributed Operating Systems

Project 2 Bonus Report

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Running the Project:

1) Go to the directory in which Project2.scala is located using cd commands (path: GossipSimulator\src\)
2) To run the bonus run scalac Project2Bonus.scala
3) After compilation give the input and hit return and wait for the output.
   (Input format: **scala Project2Bonus #ofNodes topology(full, line, 3D or imp3D) action(gossip or pushsum) #ofFailureNodes**)

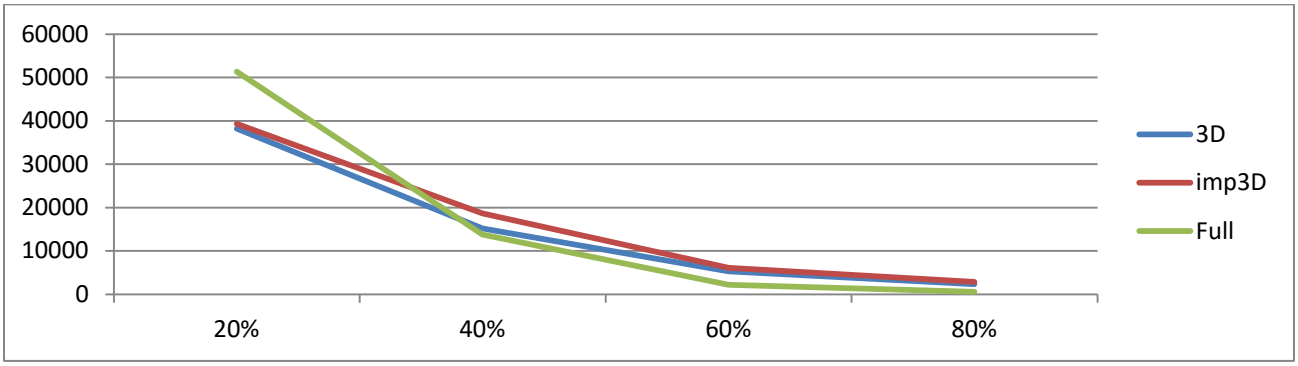
Observations:

What's working:

For failure we took 1728 nodes and we found out the convergence times for gossip and pushsum algorithms for all the topologies, except Line(reason for which is explained in 'Interesting Findings' below), for 20%, 40%, 60% and 80% failure rates.

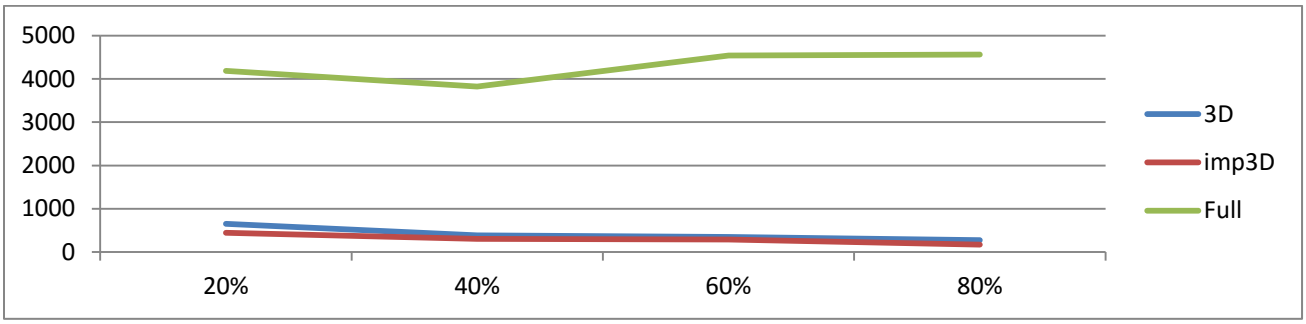
Gossip:

Below is the graph for gossip, for 3D, imp3D and Full topologies, comparing for 20%, 40%, 60% and 80% failure rates:



Push Sum:

Below is the graph of pushsum, for 3D, imp3D and Full topologies, comparing for 20%, 40%, 60% and 80% failure rates:



Interesting Findings:

1. We excluded Line topology because, if one node fails randomly then the topology network is broken and the message is not transmitted to its neighbor.
2. For the same input the timing is fluctuating for any 2 different runs.
3. We found it interesting that in gossip the timing decreased exponentially for increase in failure nodes
4. As failure nodes increase Full topology shows the most time improvement for gossip algorithm.
5. Whereas in pushsum Full topology first decreases and then increases it's time for increase in failure nodes.
6. For pushsum we observed that imperfect 3D grid has a slightly better performance than 3D and the Full topology presents the worst performance.
7. We can further improve the performance of our code if we use arrays or hash tables instead of using Lists.