

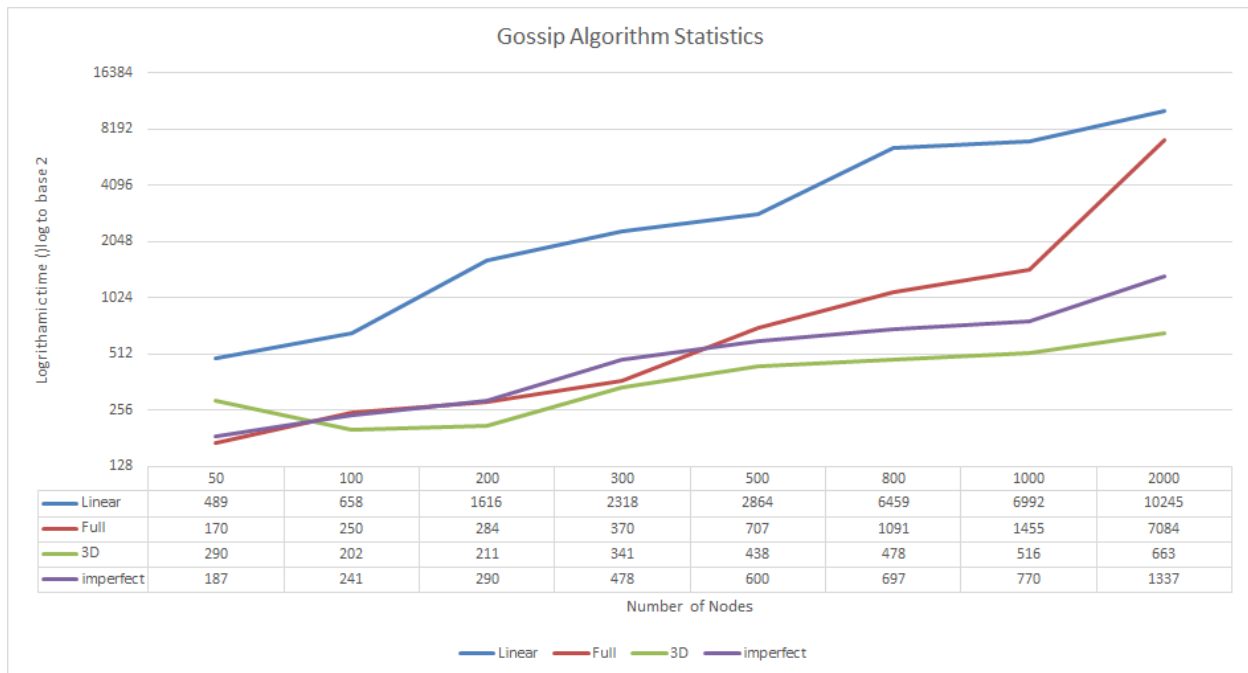
Analysis File

(A) Results for the regular project question

(1) Gossip Algorithm

Below is the graph for the Gossip Algorithm

Observations: We found 3D and Imperfect 3D to be the best performing topologies for this implementation with worst performance on Linear Topology.

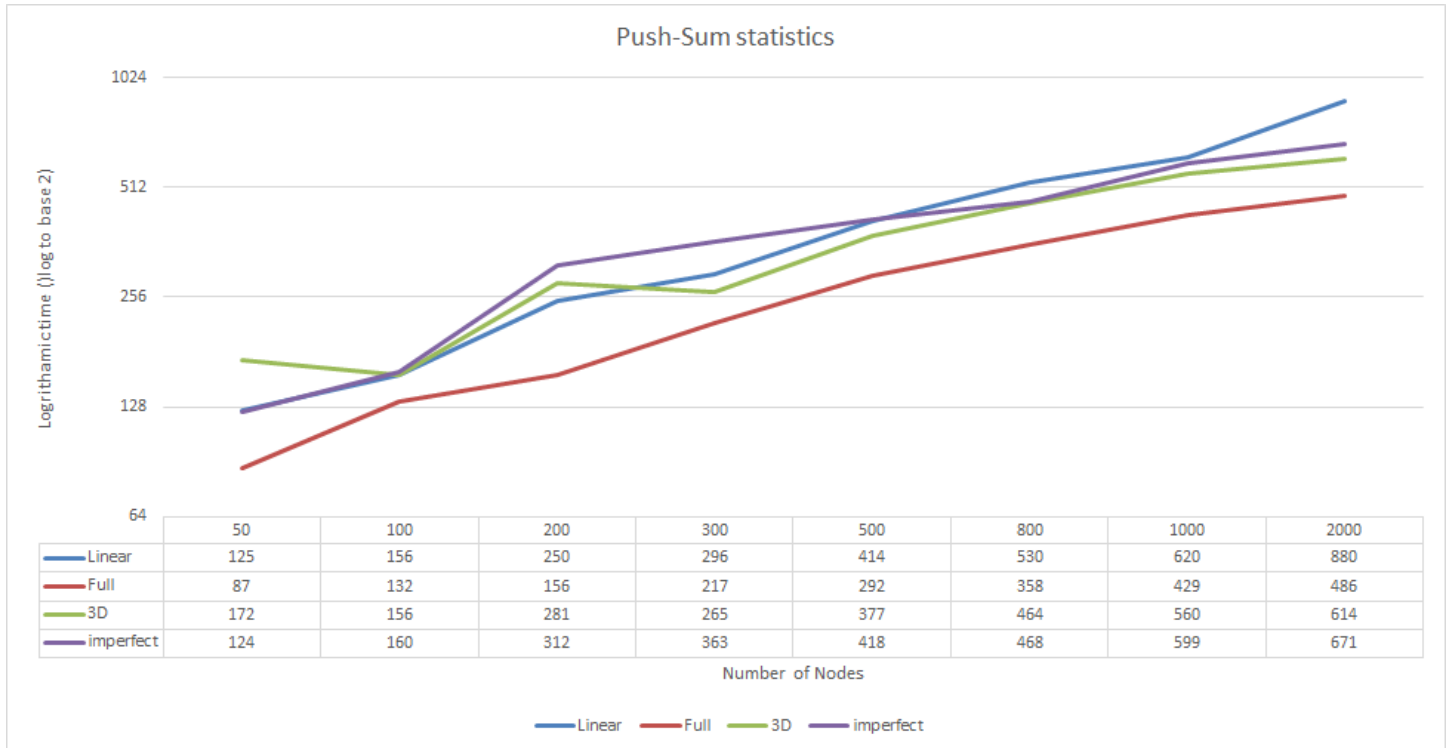


(2) PUSH-SUM Algorithm

Below is the graph for the PUSH-SUM analysis

We found the best performing topology to be Full Network, with 3D and Imperfect 3D more or less on the similar lines.

In general the convergence was reached much earlier in the PUSH-SUM implementation in comparison to the Gossip implementation.



Observations and Implementation information:

1. While building the Imperfect 3d topology, a random neighbor has to be selected in addition to the conventional neighbors. This was implemented by making sure that the new random neighbor chosen is not the current node or one of the neighbors
2. While implementing the imperfect 3d topology we came across this case multiple times where there was no convergence for the gossip implementation, which we later realized was due to the random neighbor of the node. Suppose this node is down, since it does not include the current node in its neighbors the information about it being shut down is not received. We handled the same by making sure that whenever a node is done transmitting messages in the Imperfect 3d topology it sends out a message to all the nodes in the system that it is down so that neighbors can be adjusted accordingly. After implementing this,

normalcy was returned to the system as far as convergence for the imperfect 3D topology is concerned.

3. In short, we made excessive effort on covering the corner cases in the implementation of the Imperfect 3D topology
4. We have used the context scheduler for the actor to propagate the messages in timely intervals randomly to its neighbors
5. In the gossip implementation the exit strategy is when each actor receives at least 10 rumors

Unfavorable Observations:

We observed a huge variance in the convergence time of the implementations for multiple runs, for the purpose of plotting we used the average of these observations