Project 2

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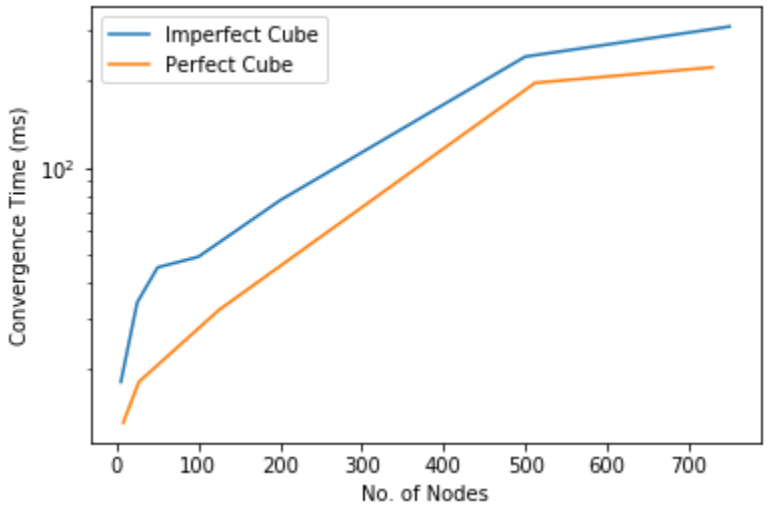
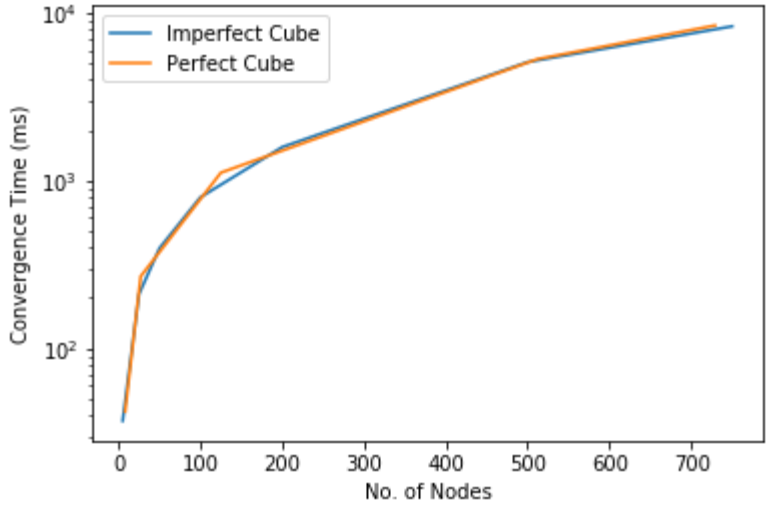
Interesting Findings

1. In case of gossip, the time interval between forwarding gossips should not be low (like more than 30ms). Slower the network, harder it is for the whole network to converge, as it may leave behind few nodes alone un-converged.
   Conclusion: Better latency, faster communication means more chances of whole networking getting converged.
2. In case of push-sum, the time taken by full topology to converge is extremely high compared to topologies like 3D, because full topology requires huge computation power to process incoming messages. In full topology, there is a chance that S/W update message may keep piling up from the neighbors, but the node is still busy updating S/W for one of the messages, resulting in a huge backlog of messages in the queue.
   Conclusion: The need of faster computation may supersede the need of fast communication in push-sum algorithm or especially full topology in push-sum algorithm.
3. We observed the convergence time is optimal for 3D topology in case of gossip. In case of pushsum, it is optimal for Imp3D topology.
4. We observed that if the number of nodes in 3D topology are perfect cube, then the convergence time is less in case of gossip. But, this observation does not reflect in case of pushsum. Refer below two graphs:



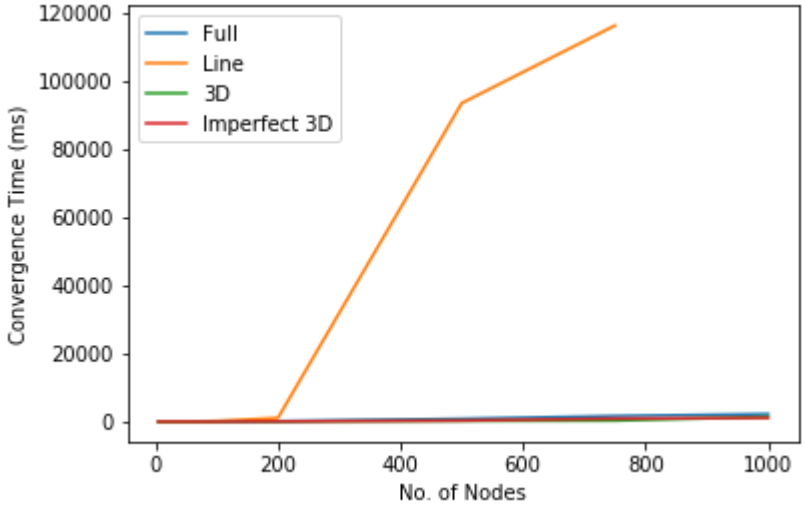
Gossip Protocol



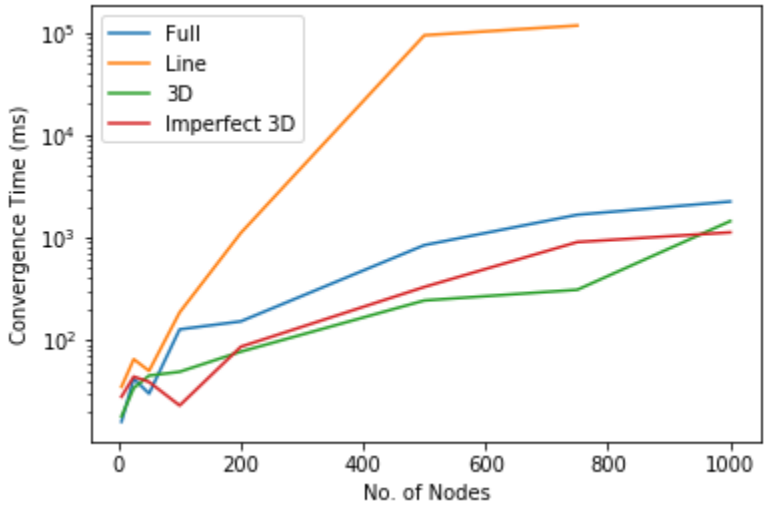
Push-Sum Protocol

Plots

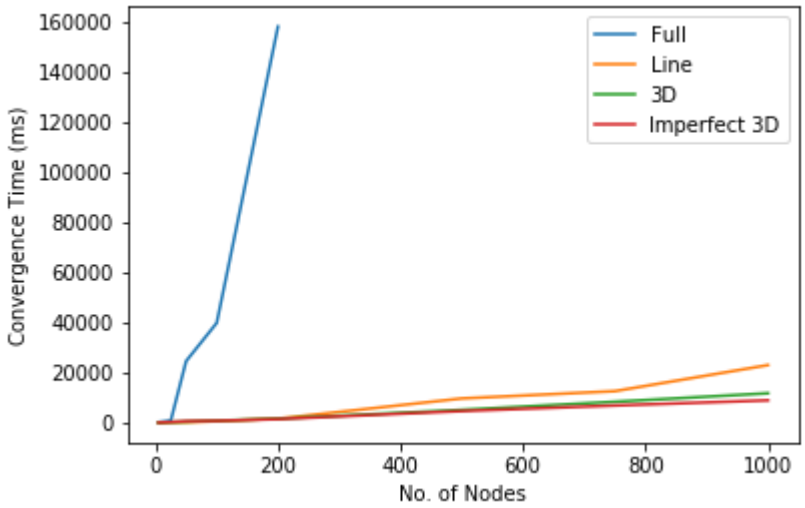
Graph for Gossip



Logarithmic graph for Gossip



Graph for Push-Sum



Logarithmic graph for Push-Sum