

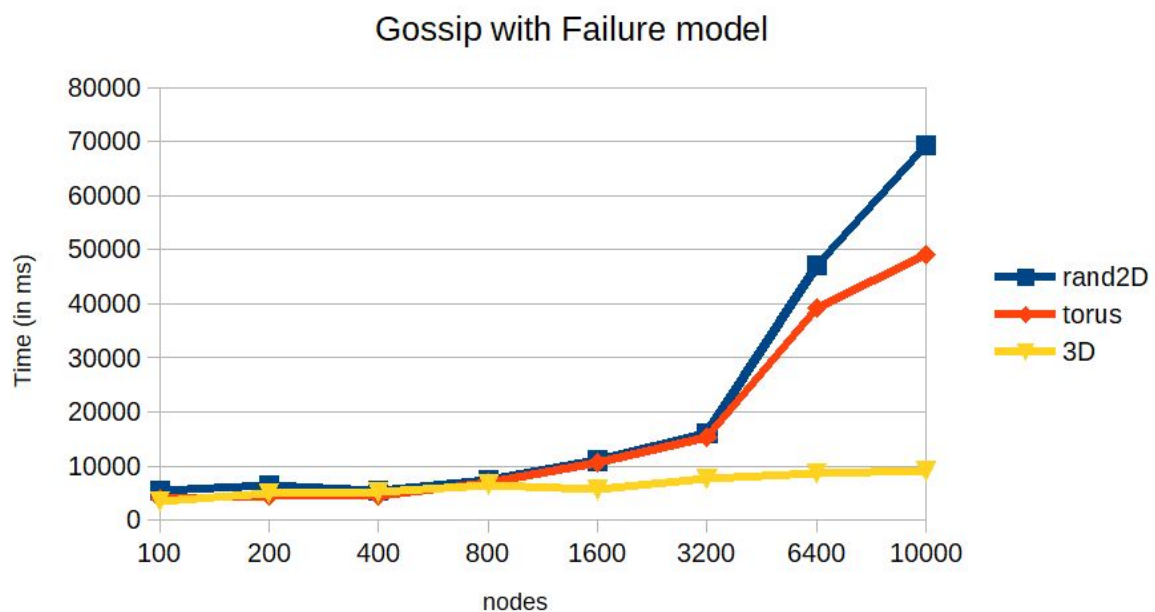
DOS Project 2 Bonus Report

Group Members

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Gossip Algorithm

We have set the interval at which each actor randomly sends a message to its neighbor as 100ms. The node failure percent for each of the graphs below is 20%. That means each of the actor has a 20% probability of being killed.



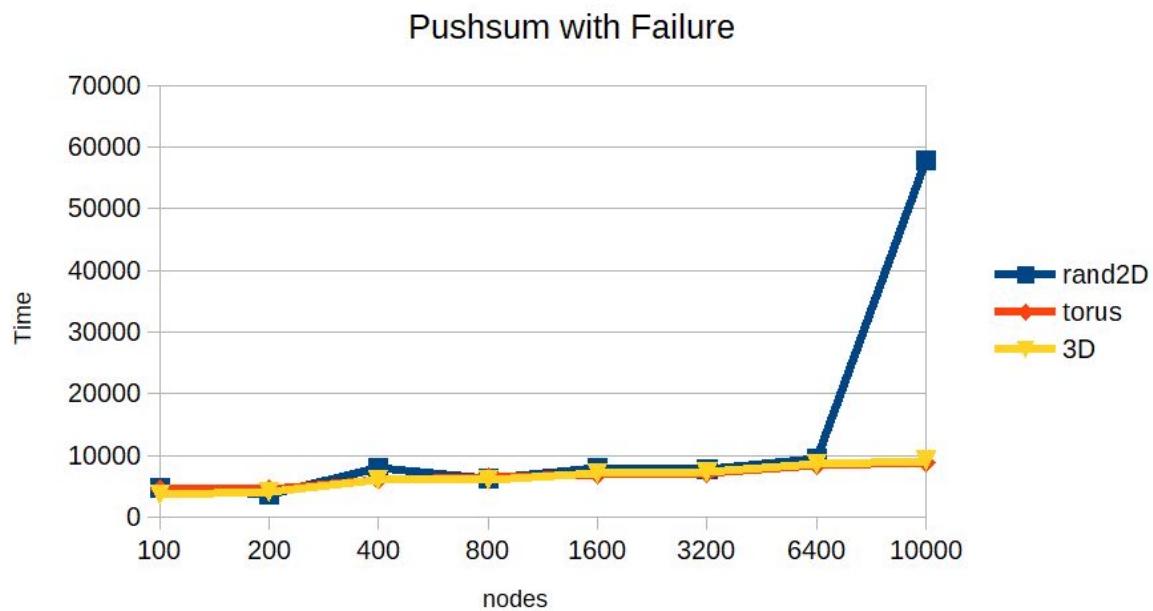
Analysis:

- From the above convergence graph, we can see the following relation between different network: $\text{rand2D} < \text{torus} < 3\text{D}$
- Convergence time of the line and fully connected network increases exponentially. Hence we did not show it in the above graph.
- The fully connected network does not work above 1600 nodes, due to the increased memory utilization to store address of all the nodes.

Interesting Point of Observation:

- There is an improvement in convergence time from line to imp2D. This is because of adding random connections in a simple line network.
- Also, the convergence time of the fully connected network increases exponentially as the no. of nodes rises. This is because of the increased memory utilization by each node to store the address of all the other nodes.

Pushsum



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Interesting Point of Observation:

- There is an improvement in convergence time from line to imp2D. This is because of adding random connections in a simple line network.
- Also, the convergence time of the fully connected network increases exponentially as the no. of nodes rises. This is because of the increased memory utilization by each node to store the address of all the other nodes.
- Introducing failures leads to convergence faster in some cases, because the neighbours of the nodes are fewer. This leads to the node converging even when the limit hasn't reached.

Conclusion: The gossip and pushsum protocols are fault tolerant. Failure of nodes does not affect the accuracy of the algorithm.