PROJECT REPORT

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Gossip Algorithm:

Convergence event occurs once all the nodes in the network have heard the rumor at least once. A node stops transmitting a rumor after it hears the rumor for 10 times.

Findings:

Torus network achieves fastest convergence.

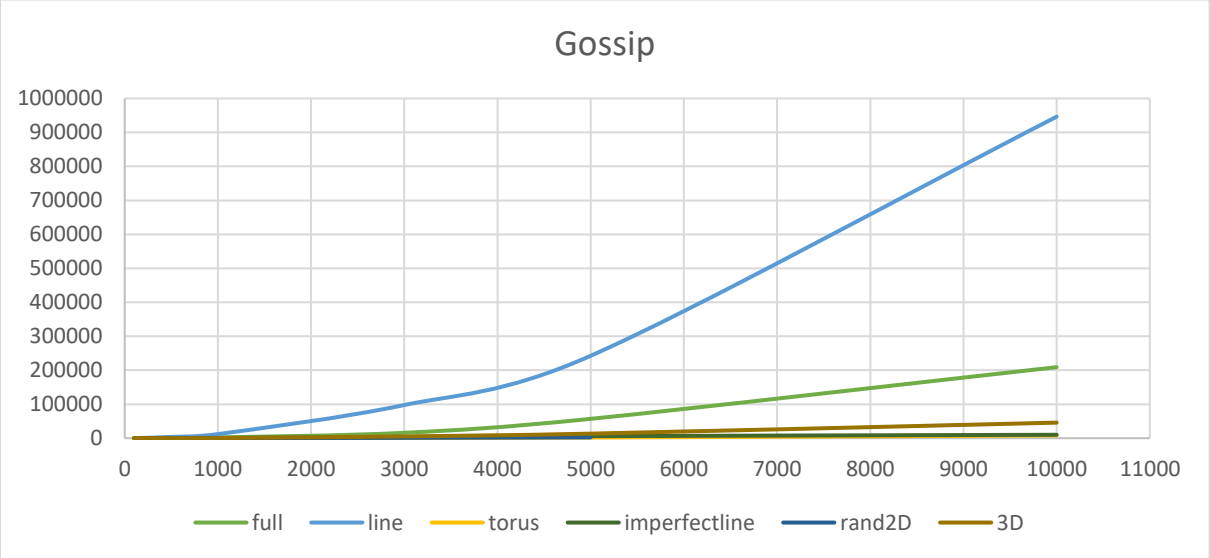
Line topology has the largest convergence time. The number of nodes in the network increases the convergence time increases exponentially.

Full topology has less convergence time for smaller nodes upto 100, but as the nodes increase the convergence time increases due to the memory occupied by adjacent node lists stored for every node.

Rand2D works even for 10,000 nodes but the way we are creating the topology for rand2D takes a lot of time since we are using O(n2) loops. Rand2D works for starting from 100+ as we need to assign unique values in x-y plane. We've started taking output from 500.

Graph for gossip protocol:

X axis represents the number of nodes and y axis represents the convergence time in milli seconds.



Push Sum Algorithm:

The convergence event occurs when for all the nodes, the s/w ratio does not change for more than 10^-10 for three consecutive rounds. We terminate the program after all the nodes have achieved convergence.

Findings:

Imperfect line has the least convergence time for push sum

Topologies with random neighbours cover faster then rigid topologies.

Line topology has the largest convergence time.

Full topology has less convergence time for smaller nodes upto 100, but as the nodes increase the convergence time increases due to the memory occupied by adjacent node lists stored for every node.

Graph for Push Sum:

X axis represents the number of nodes and y axis represents the convergence time in milli seconds.