

Bonus Part

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We have implemented node and failure model for **gossip algorithm**.

Our implementation is based on the comparison of spread of rumor in 5 seconds for each topology. We have calculated the percentage spread i.e.

$$\% \text{ Spread} = \text{Rumor received by number of nodes} / \text{Total Nodes}.$$

For the results included in this report, we considered 3 cases of failure nodes.

1. No failure
2. 10% failed nodes
3. 20% failed nodes

Each topology has been compared for these 3 types of failure conditions.

Our key observations:

1. For line topology, failure of nodes significantly reduces the spread of rumor. That means rumor doesn't get spread to active nodes due to the presence of failed i.e. disconnected nodes.
Less than 10% of nodes got the rumor in case of 10% and 20% failed nodes
2. In case of full, 2D and Imperfect 2D, rumor spread was better as, except disconnected nodes, almost all other nodes received the rumor.
More than 90% of alive nodes heard the rumor even though few nodes were disconnected for full, 2D and Imperfect 2D topologies

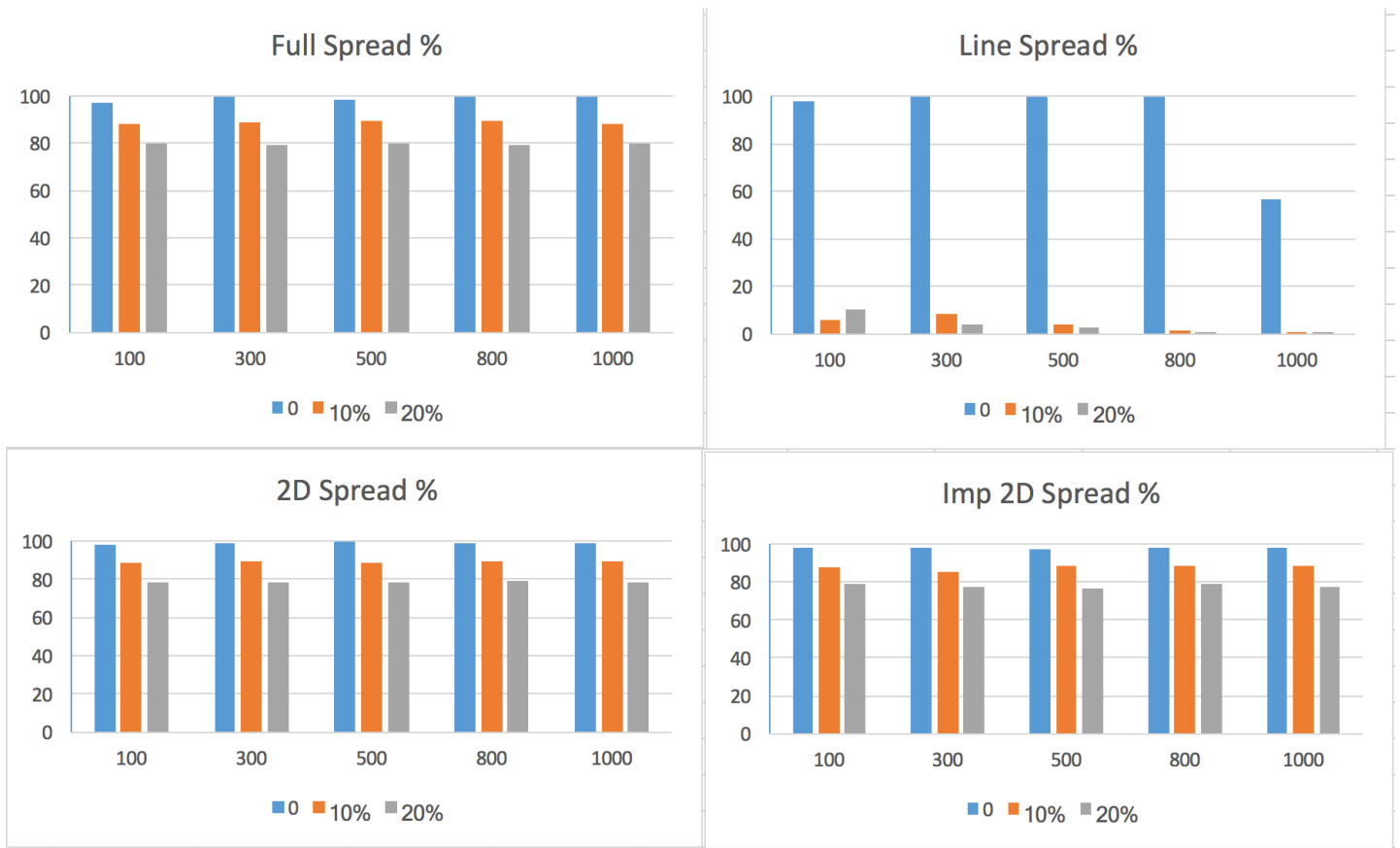


Fig1: Percentage spread in 5 seconds for 100, 300, 500, 800, 1000 nodes for all topologies

Run Instructions:

1. `cd project2-bonus && mix escript.build`
2. `./project2 100 full gossip 10`
 100: Number of nodes
 full: Topology
 gossip: Algorithm
 10: % of failed nodes (Has to be integer)

More examples:

`./project2 800 2D gossip 20`
`./project2 1000 line gossip 0`