

# **COP5615 - Distributed Operating System Principles**

## **Project 2 – Gossip Simulator**

### **Members**

- Sai Chandra Sekhar Devarakonda (UFID: 9092-2981)
- Sumanth Chowdary Lavu (UFID: 5529-6647)

### **Analysis and Graphs**

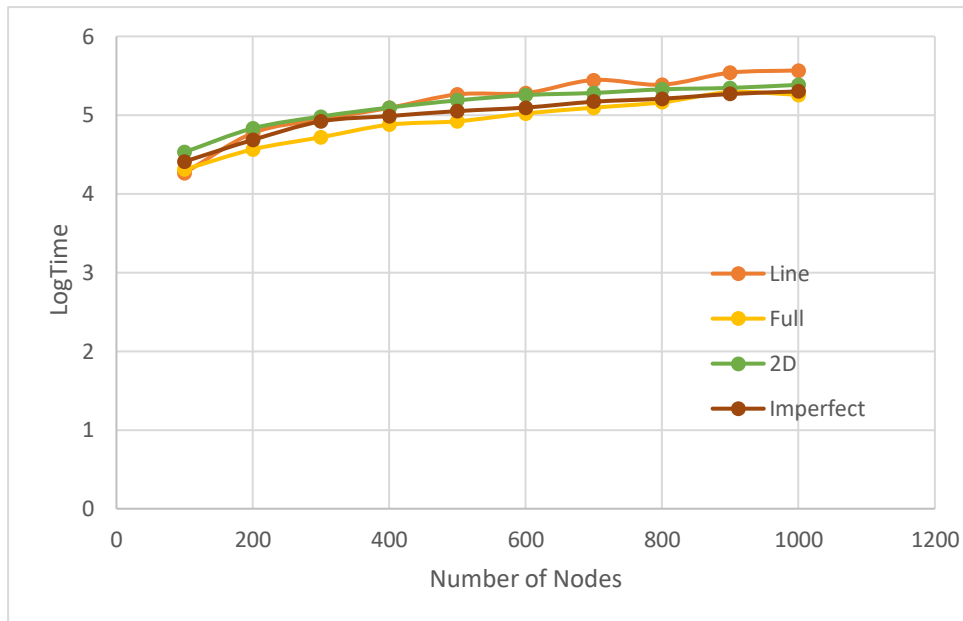
Analysis was done over a wide range of nodes for all the topologies. To simplify the graphs, times were taken on logarithmic scale.

The time taken here is the elapsed time which is displayed after all the nodes are converged. The times in the tables are in milliseconds.

#### **Times for Pushsum algorithm:**

Nodes	Topologies			
	Line	Full	2D Grid	Imperfect 2D Grid
100	18428	20381	33963	25732
200	59090	36714	67896	48478
300	88684	52408	96111	83261
400	123536	75555	124686	97324
500	183377	83545	153959	112523
600	190684	105127	179563	124735
700	279466	124457	191428	148038
800	243734	145399	212703	161738
900	346100	195910	221890	185390
1000	369503	181079	242569	200179

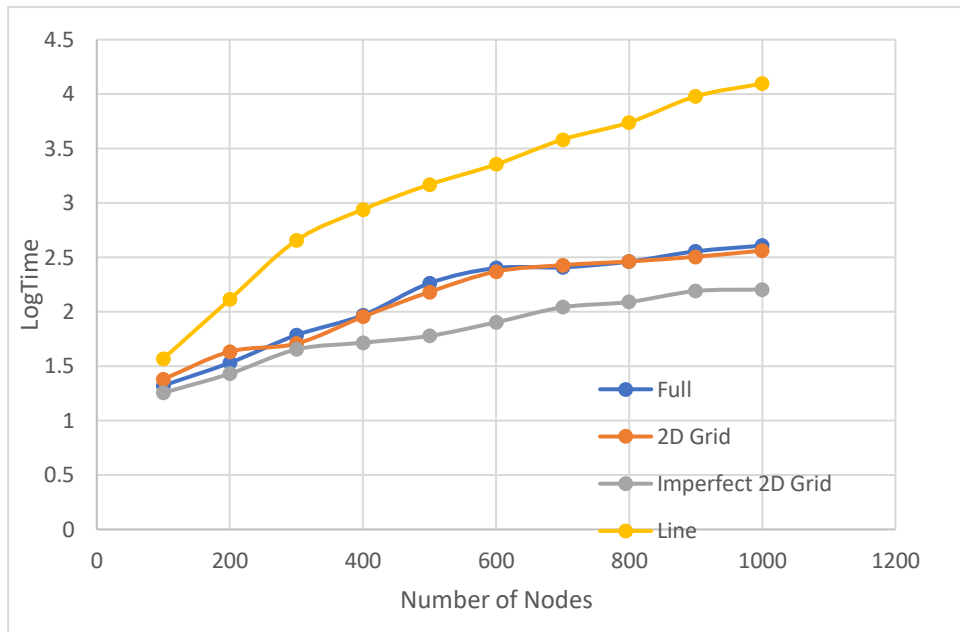
**Graph for Pushsum algorithm:**



**Times for Gossip algorithm:**

Nodes	Topologies			
	Line	Full	2D Grid	Imperfect 2D Grid
100	37	21	24	18
200	130	34	43	27
300	452	61	51	45
400	871	93	90	52
500	1474	183	152	60
600	2257	252	234	80
700	3823	256	268	110
800	5491	289	290	123
900	9532	359	320	155
1000	12478	405	365	160

### Graph for Gossip algorithm:



This gossip algorithm was run on hexa-core processor. That is why we can see small values for gossip algorithm.

From the graph one can clearly observe that the line topology takes more time to converge compared to other topologies.

### Interesting Facts:

- In the line topology a node can have at most two neighbours and it takes more time to converge. So, we can tell that the performance is better in well-connected networks.
- By observing the slope of plots we can say that the performance of topologies is not much dependent on number of nodes. The reason for this is the gossip algorithm is asynchronous.