COP5615 – Distributed Operating System Principles

Fall 2020

Project 2 – Gossip Simulator

Team:
Sandeep Sathyanarayana (UFID: 5162-1693)
Vignesh Ravi (UFID: 4815-4417)

LARGEST NETWORK TESTED

1. GOSSIP

Topology	Number of Nodes
Full	10,000
2D	1,000
2D Imperfect	10,000
Line	1,000

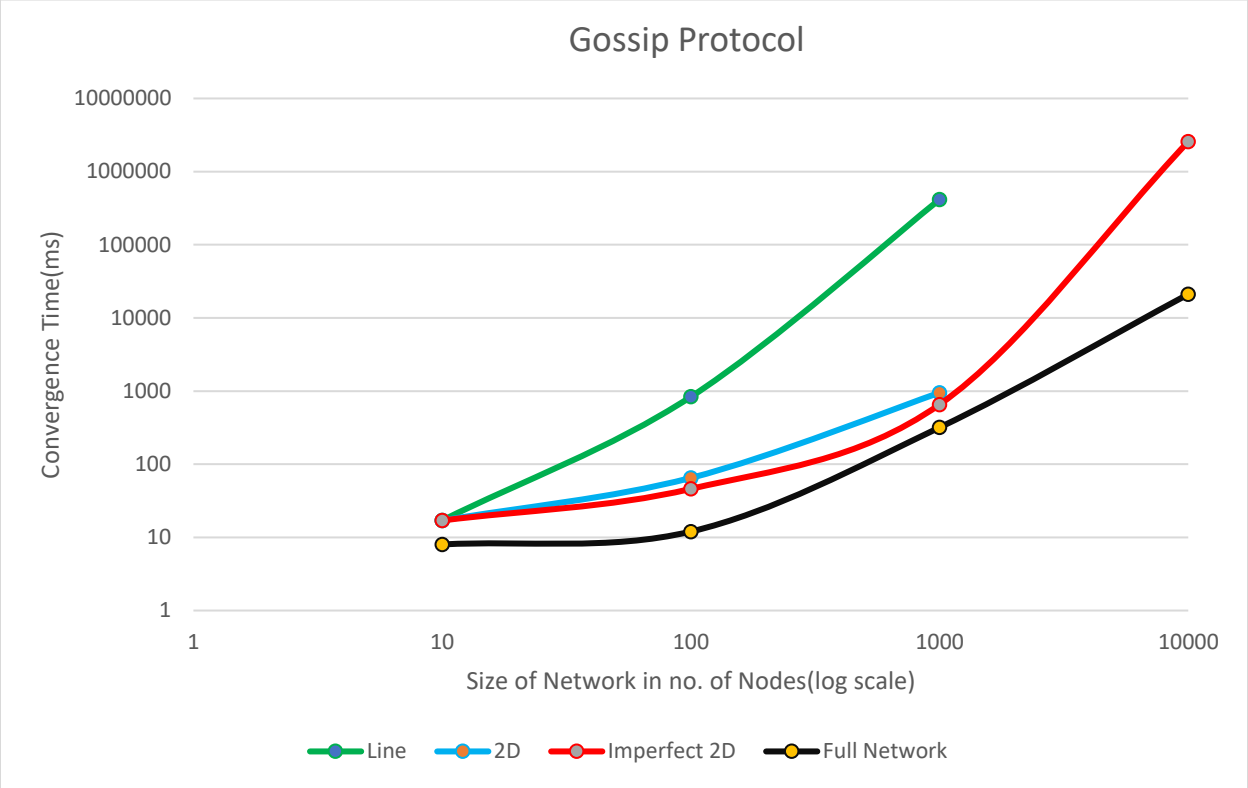
2. PushSum

Topology	Number of Nodes
Full	10,000
2D	1,000
2D Imperfect	10,000
Line	1,000

CONVERGENCE TIME (LOG SCALE) VS SIZE OF NETWORK IN NO. OF NODES (LOG SCALE)

1. **Gossip**

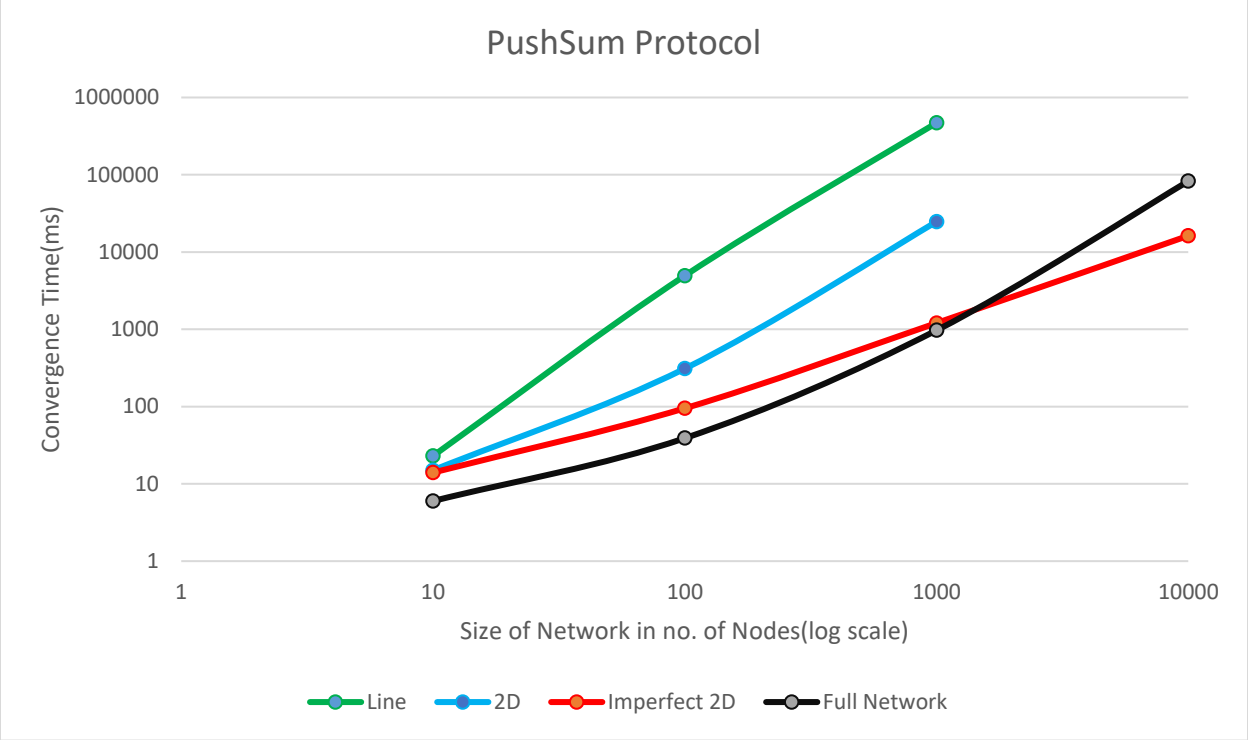
Nodes(No.)	Line(ms)	2D(ms)	Imperfect 2D(ms)	Full (ms)
10	17	17	17	8
100	835	65	46	12
1000	415568	950	655	318
10000	N/A	N/A	2569057	21068



As observed from the above graph Full topology performs better overall. For 10,000 Nodes 2D and Line topologies couldn't converge within the scale of the graph depicted above.

2. PushSum

Nodes(No.)	Line(ms)	2D(ms)	Imperfect 2D(ms)	Full (ms)
10	23	15	14	6
100	4939	310	95	39
1000	467649	24687	1205	970
10000	N/A	N/A	16220	82610



As observed from the above graph it is evident that Imperfect 2D topology performs better for larger number of nodes as compared to Full topology and returns a near accurate sum value as noted in the below table.

SUM ACHIEVED FOR PUSHSUM ALGORITHM FOR DIFFERENT NETWORK SIZE

Nodes(No.)	Line		2D		Imperfect 2D		Full Network	
	Time(ms)	Sum	Time(ms)	Sum	Time(ms)	Sum	Time(ms)	Sum
10	23	44.99	15	120	14	199.99	6	45
100	4939	4949.911	310	4949.99	95	4950	39	4949.99
1000	467649	474892.298	24687	523776	1205	523775.99	970	499500
10000	N/A	N/A	N/A	N/A	16220	49994999.99	82610	49994999.99

NUMBER OF NODES THAT STOPPED TRANSMISSION OF GOSSIP BEFORE CONVERGENCE FOR DIFFERENT NETWORK SIZE

Nodes(No.)	Line		2D		Imperfect 2D		Full Network	
	Time(ms)	Count	Time(ms)	Count	Time(ms)	Count	Time(ms)	Count
10	17	10	17	15	17	16	8	10
100	835	84	65	96	46	96	12	100
1000	415568	420	950	942	655	974	318	1000
10000	N/A	N/A	N/A	N/A	2569057	9559	21068	9999