DOS (COP-5615) Project 2 Report

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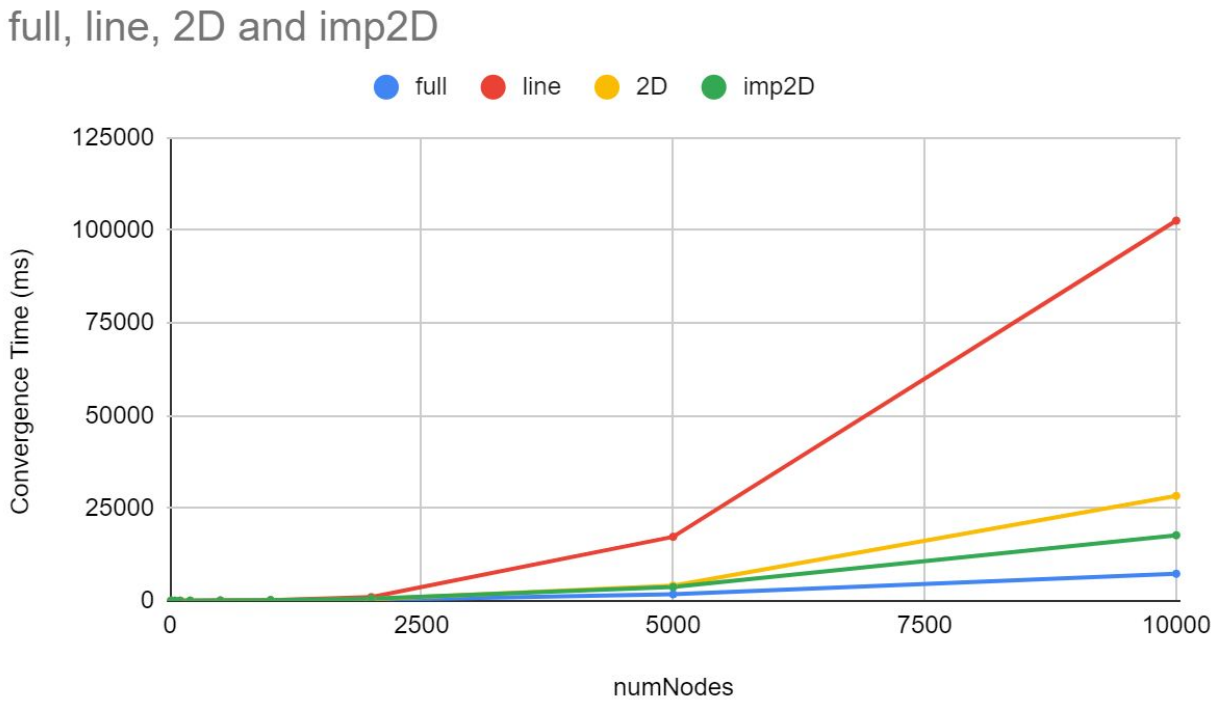
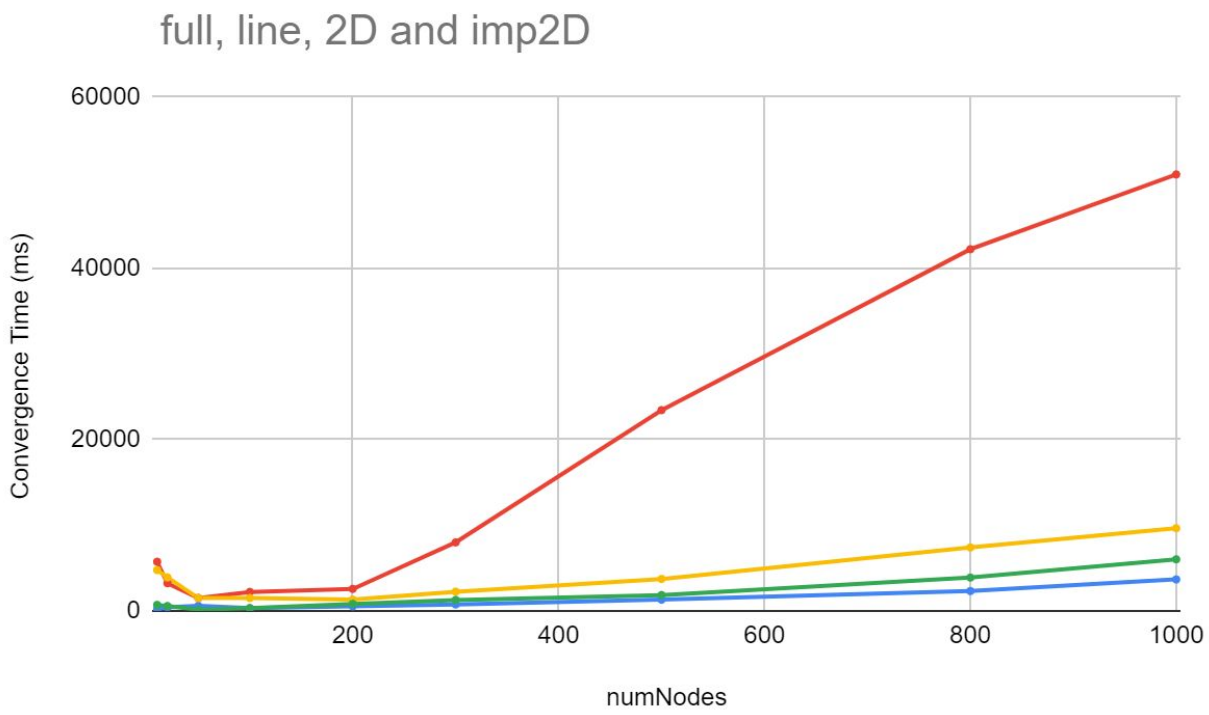
Data/Graph for Gossip Protocol

numNodes	full	line	2D	imp2D
10	10.4	13.34	13.6	18.7
20	11.3	11.3	13.9	11.9
50	12.8	15.3	15.8	14.4
100	13.89	17.7	22.4	21.5
200	21.6	25.4	42.7	37.6
500	37.6	100.4	56.9	78.4
1000	95.7	198.7	143.5	215.2
2000	270.1	1006.1	481	632.9
5000	1777.2	17297.2	4117.2	3730
10000	7311.7	102617.2	28337.5	17715.2
20000	34574.4		278297	111326.8



Graph for PushSum Protocol

numNodes	full	line	2D	imp2D
10	195	5738	4767	697
20	402	3231	3910	567
50	595	1507	1497	133
100	323	2213	1500	315
200	534	2569	1310	819
300	751	7998	2242	1271
500	1307	23445	3725	1849
800	2314	42232	7408	3887
1000	3670	50973	9656	6020



Observations:

1. As apparent from the graph, the full topology converges fastest in both algorithms and line converges slowest. Also, imperfect 2D converges faster than 2D.
   Convergence time => full < imp2D < 2D < line
2. Convergence time increases exponentially for line topology with the number of nodes.
3. Full topology either converges or 1 node remains which is expected.
4. Line topology, if triggered from the middle of the line, converges faster.
5. 2D and imperfect 2D, if triggered from the middle of mesh, converges faster.
6. Full topology spreads the gossip exponentially.
7. Line topology spreads the gossip ~linearly.