PROJECT REPORT

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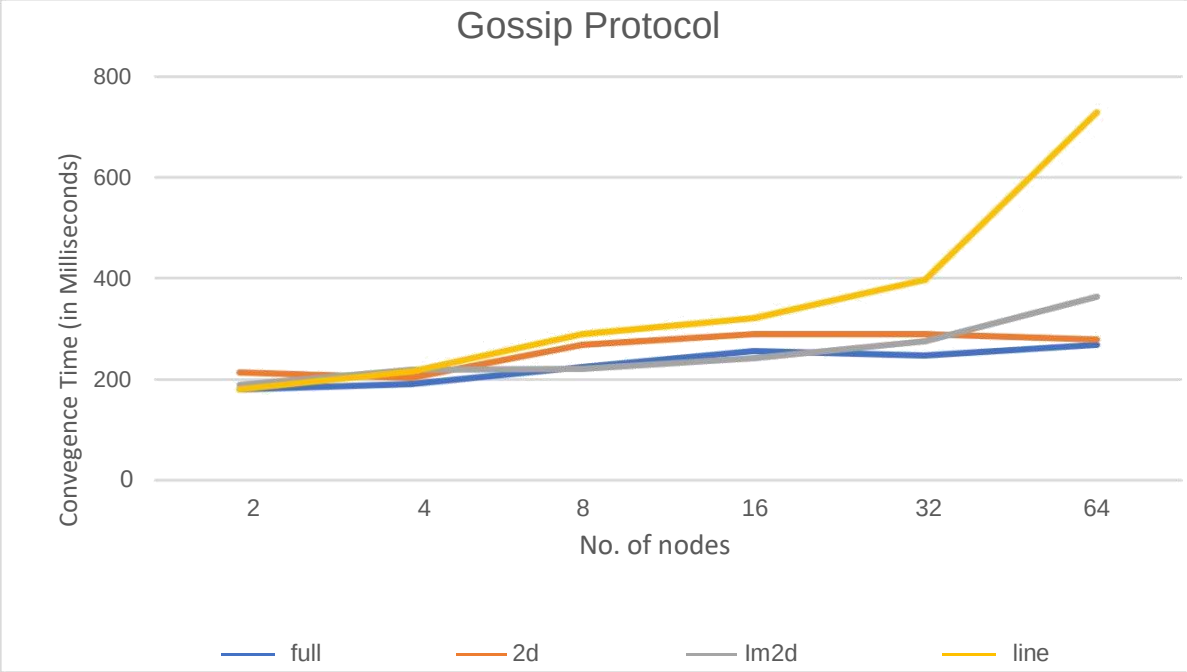
Gossip Protocol (convergence time in milliseconds)

- Using the Gossip Algorithm, we tested all the network Topologies, increasing the number of nodes by a power of 2 each time.
- The convergence occurred when all the nodes in the network received the rumor at least 10 times.
- Line topology took the longest time to converge. It took around 30 minutes to converge for 10000 nodes.
- In comparison to Line topology, the rest of the topologies converged much faster and full network being the fastest of all.

No. of Nodes	full	2d	lm2d	line
2	180	213	188	179
4	190	202	219	215
8	223	267	220	289
16	256	289	242	322
32	247	290	275	398
64	268	278	363	729
128	258	334	320	2017
256	314	402	400	1995
512	324	417	412	4865

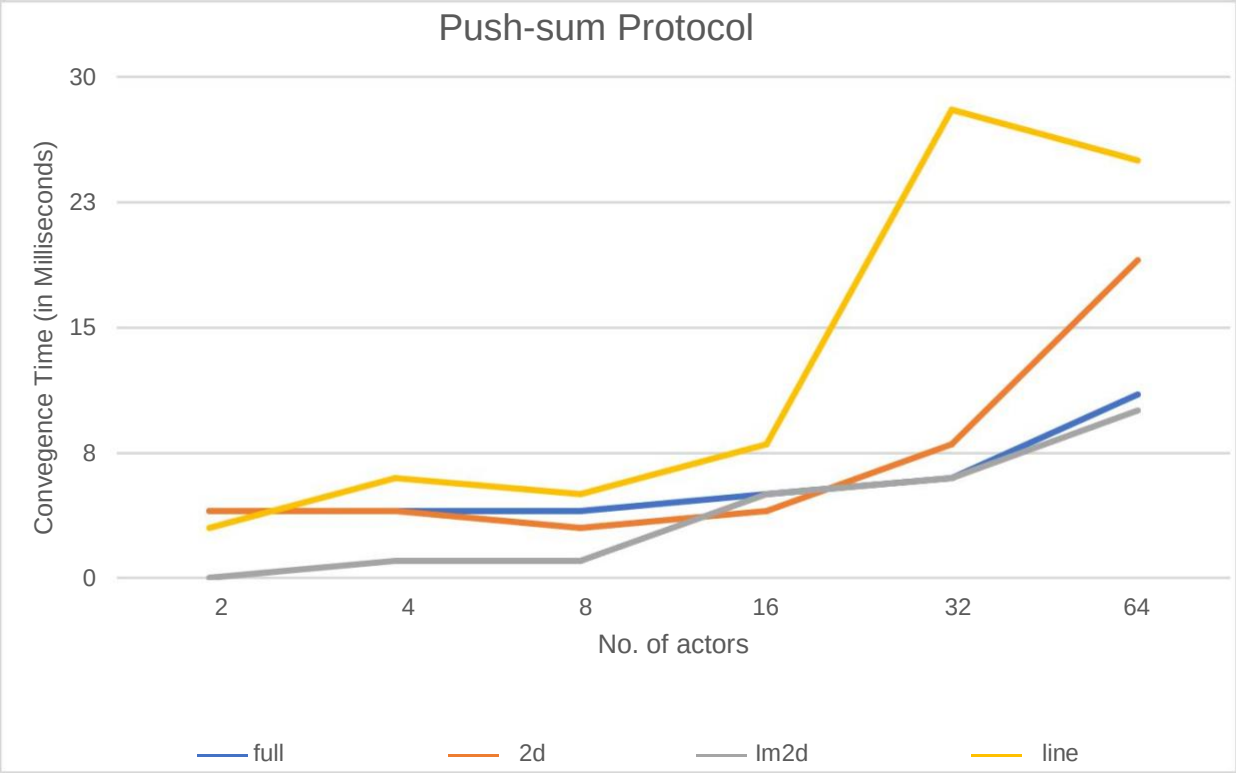


Push-sum Protocol (convergence time in milliseconds)

- Using the Push-Sum algorithm, we tested all the network topologies.
- Line Topology took the most amount of time to converge and it would take huge amount of time on larger number of nodes.
- With the increase in the number of neighbor, the network gets more sensor and hence the sum is distributed more uniformly over entire network, hence convergence would be the fastest.
- Full topology converges the fastest of all.

No. of Actors	full	2d	lm2d	line
2	4	4	0	3
4	4	4	1	6
8	4	3	1	5
16	5	4	5	8
32	6	8	6	28
64	11	19	10	25
128	23	37	25	60
256	41	88	55	281

512	162	370	287	5193



OBSERVATIONS:

- The line topology takes maximum time to converge and it is most difficult to propagate the rumor, whereas the full topology will take the minimum time to converge, whether it is Gossip or Push-Sum algorithm.
- Full Network could be considered as the best to propagate the rumor and converges for the maximum nodes.
- The run-time changes for machine with higher memory and better processor (as we tested in different machines).