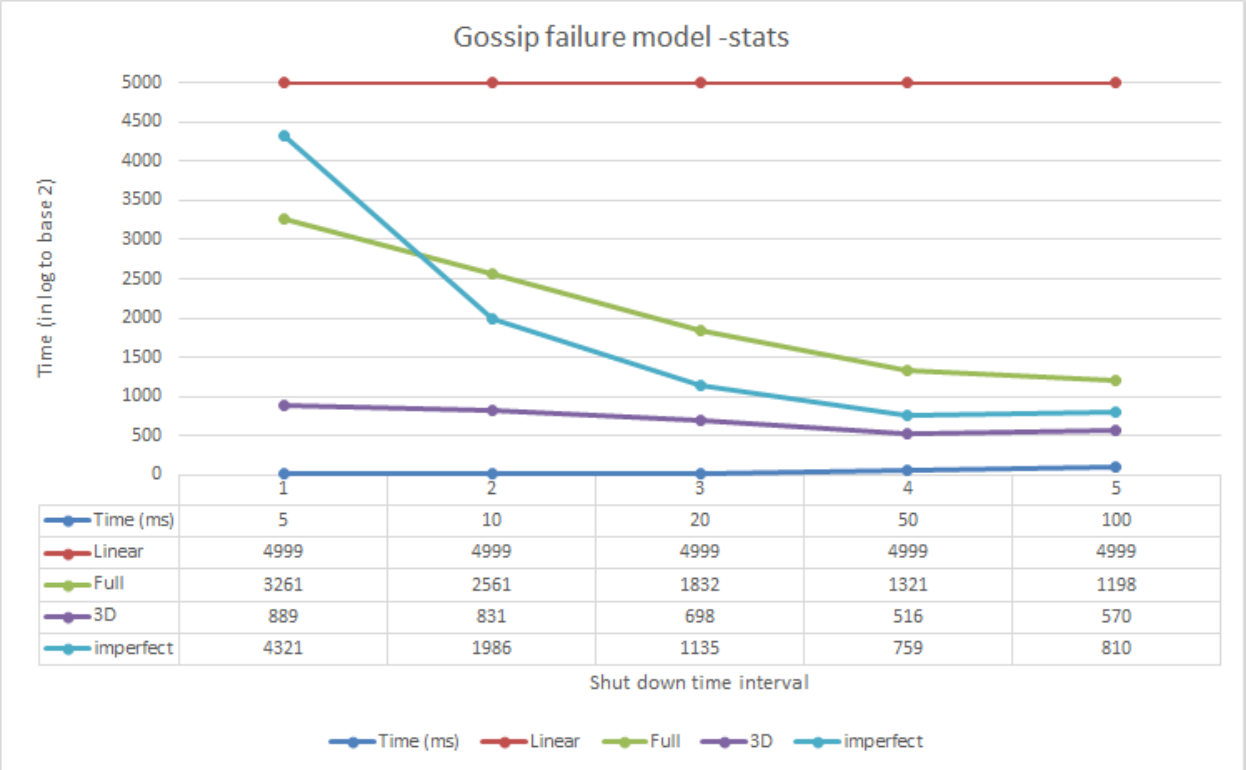
Implementation for the Bonus problem

We have implemented entire working code to replicate the failure model, please find below the implementation of the same

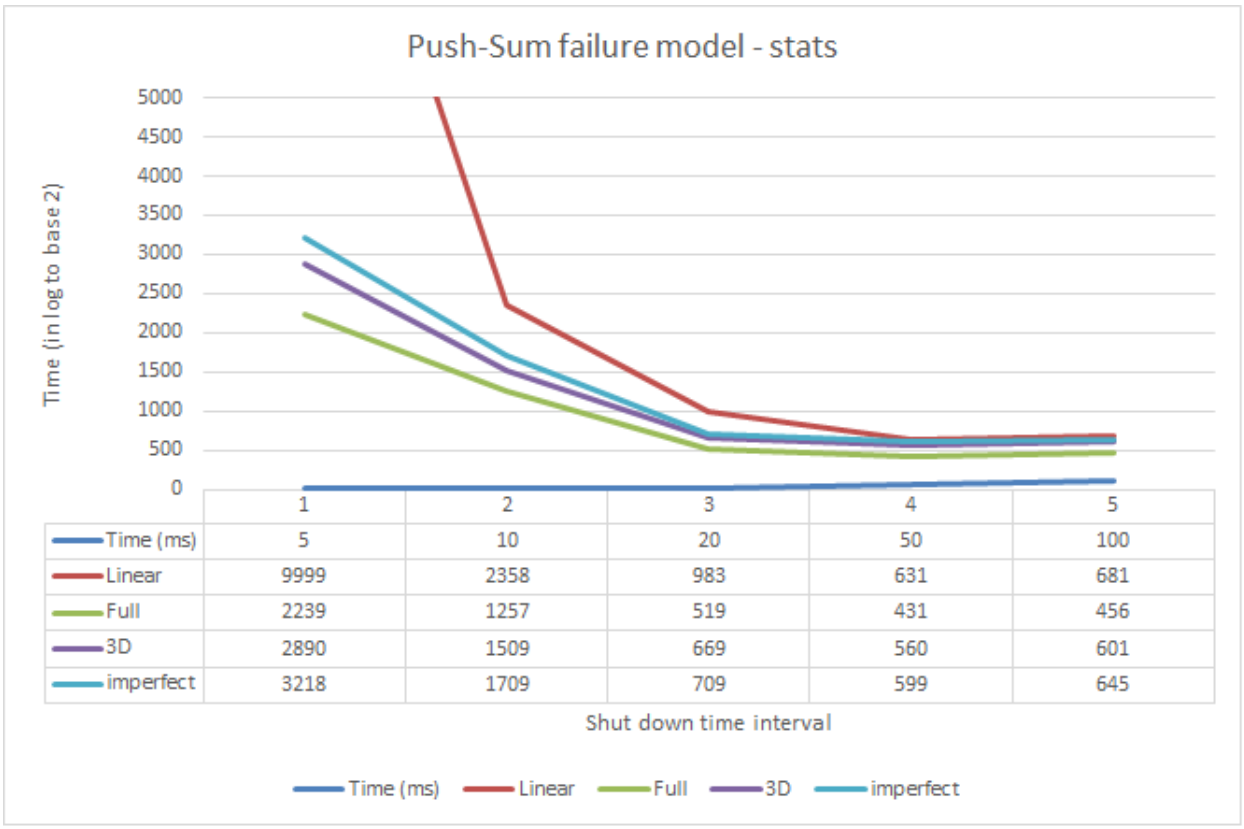
As an input argument, we have taken time interval, at this time interval a node in the system is shut down recursively till either the message is propagated or all the nodes have been shut down and convergence has not been achieved. As the interval keeps going down more and more number of nodes are shut down and the message propagation fails. We observed scenarios where the nodes were shut down successively but there was successful propagation of the message. We attribute this to the first message reaching any of the nodes is lot quicker than meeting the convergence conditions of 10 rumors in the gossip algorithm. Hence even with few nodes coming down in the system, the propagation of information is successful.

For the graph implementation, we have used 1000 actors and changed the time interval from 5ms to 100 ms and plotted the time of convergence against the interval of node shutdown

To execute use
Sbt “run 1000 gossip 5”



	1	2	3	4	5
Time (ms)	5	10	20	50	100
Linear	4999	4999	4999	4999	4999
Full	3261	2561	1832	1321	1198
3D	889	831	698	516	570
imperfect	4321	1986	1135	759	810



	1	2	3	4	5
Time (ms)	5	10	20	50	100
Linear	9999	2358	983	631	681
Full	2239	1257	519	431	456
3D	2890	1509	669	560	601
imperfect	3218	1709	709	599	645