Failure Model (BONUS)

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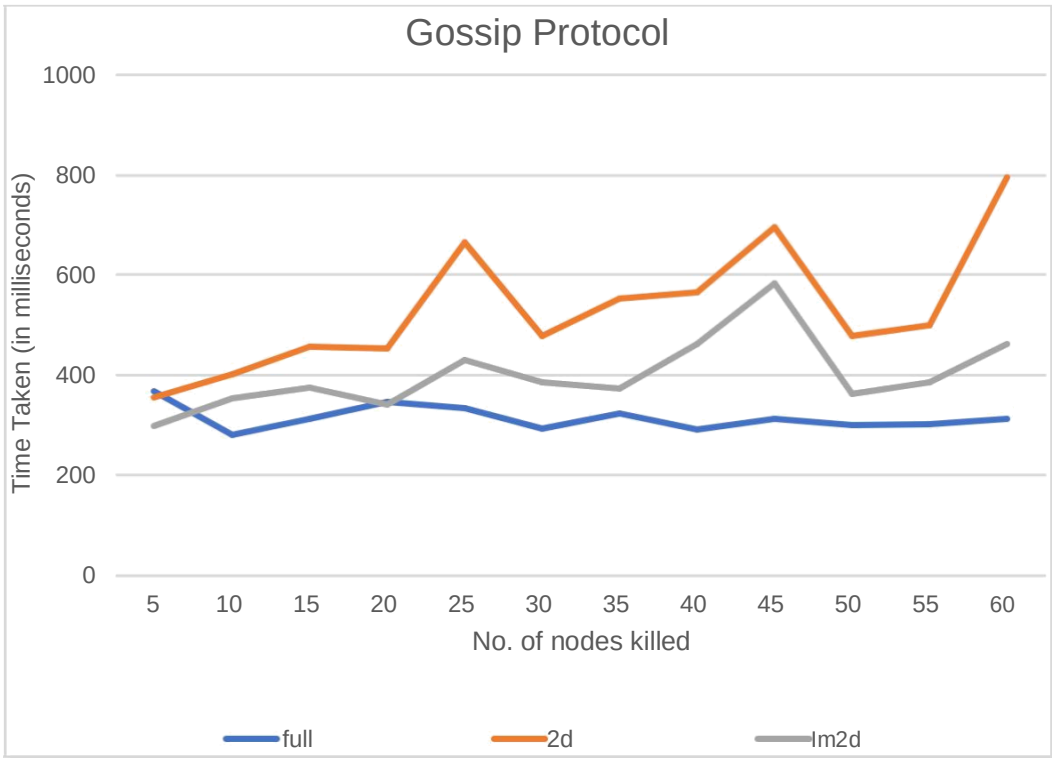
Gossip Protocol

- We here, implemented a failure model. In this, we randomly eliminated a certain number of nodes which was taken as input from user.
- Time taken to converge by remaining nodes is noted in milliseconds.

Initially, the network had 200 nodes.

- In Line Topology, even after removing one node, the network failed to reach any convergence as it breaks into two networks. If one node can cause such effect, then removing more will definitely lead to failure.
- The full, 2d and Imperfect 2d topologies handled node failures extremely well and they converged after killing up the given number of nodes, too.
- **Full** topology is the most fault tolerant and then the **Imperfect 2d** followed by **2d**.

No. of nodes killed	full	2d	Im2d
5	367	356	299
10	281	402	353
15	312	456	375
20	347	454	341
25	334	666	429
30	293	478	385
35	324	554	374
40	291	566	463
45	312	696	583
50	300	478	363
55	303	499	386
60	312	795	461

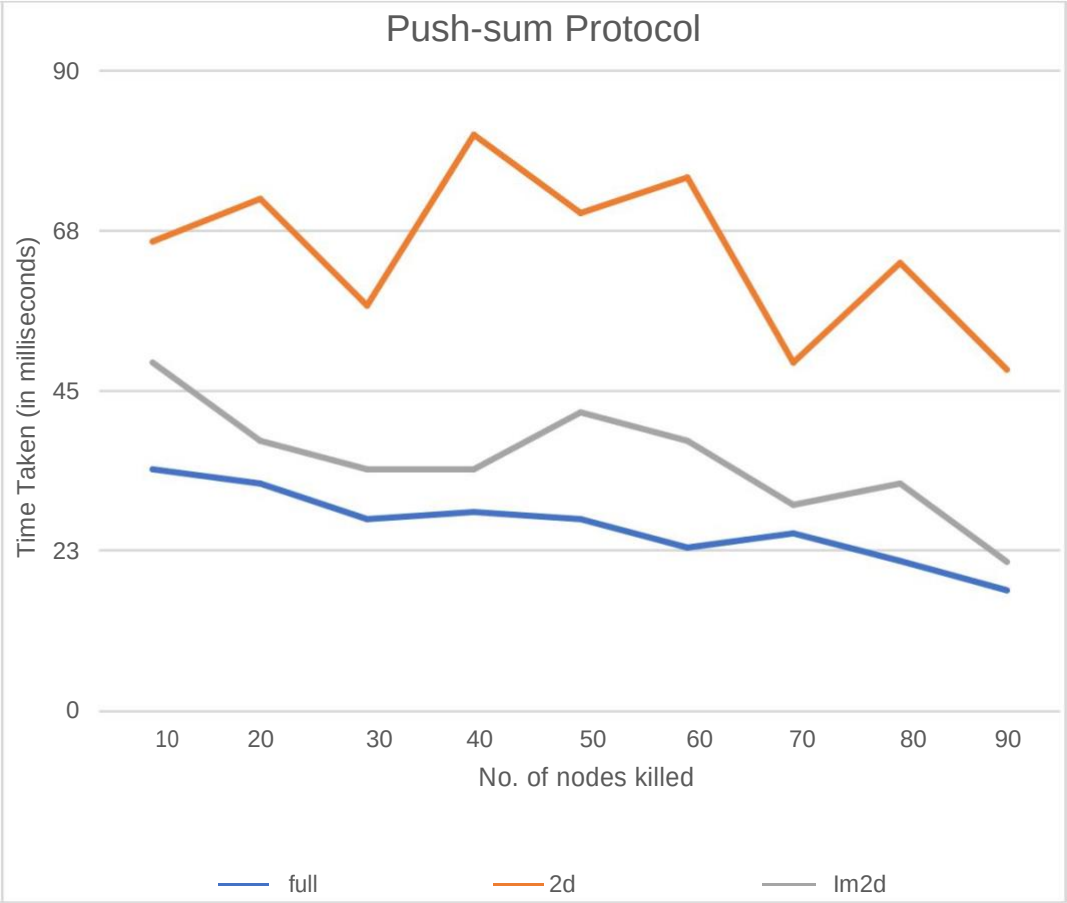


Push-sum Protocol

Initially, the network had 200 nodes.

- In Line Topology, similarly like in gossip protocol, by removing one node the networks breaks into two and hence fails to converge.
- Increasing the number of neighbours results in more dense the network, hence making the network more fault tolerant.
- Full topology is the most fault tolerant and then the imperfect 2d followed by 2d.

No. of nodes killed	full	2d	Im2d
10	34	66	49
20	32	72	38
30	27	57	34
40	28	81	34
50	27	70	42
60	23	75	38
70	25	49	29
80	21	63	32
90	17	48	21


Push-sum Protocol
90
68
45
23
0
Time Taken (in milliseconds)
10
20
30
40
50
60
70
80
90
No. of nodes killed
full
2d
lm2d