Group Members

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Our Implementation

We simulated failure of nodes for Push-Sum by randomly killing few nodes for complete topology. In our original design, a node was sending the partial ratio only when it receives a message from other nodes. But because of this, entire network was failing to converge even if a single node fails.

To handle this situation, we added a scheduler so that a node will send partial ratio to one of its neighbors periodically, even if it does not receive any message.

Observations

We observed that as the percentage of the nodes killed increases, the convergence time increases.

Even if the node failure percentage is 50%, the system is robust enough to attain the convergence with the error margin of 5%

Results

No of nodes	Failing nodes	Convergence Time bonus	No failure convergence time	Convergence Value Bonus	No Failure Convergence Value
100	10.00%	2652	1483	47.49463191	49.5
100	20.00%	3057	1483	46.61108965	49.5
100	30.00%	3394	1483	49.43705879	49.5
100	40.00%	5258	1483	45.51667233	49.5
100	50.00%	7538	1483	50.03135805	49.5
200	10.00%	3859	1995	102.1353728	99.5
200	20.00%	4088	1995	99.60936821	99.5
200	30.00%	5848	1995	97.91224076	99.5
200	40.00%	8369	1995	96.13844352	99.5
200	50.00%	9552	1995	102.0115118	99.5
500	10.00%	5963	3219	247.9777968	249.5
500	20.00%	6445	3219	253.8171059	249.5
500	30.00%	7504	3219	246.638244	249.5
500	40.00%	14514	3219	247.4957569	249.5
500	50.00%	19170	3219	253.1780977	249.5

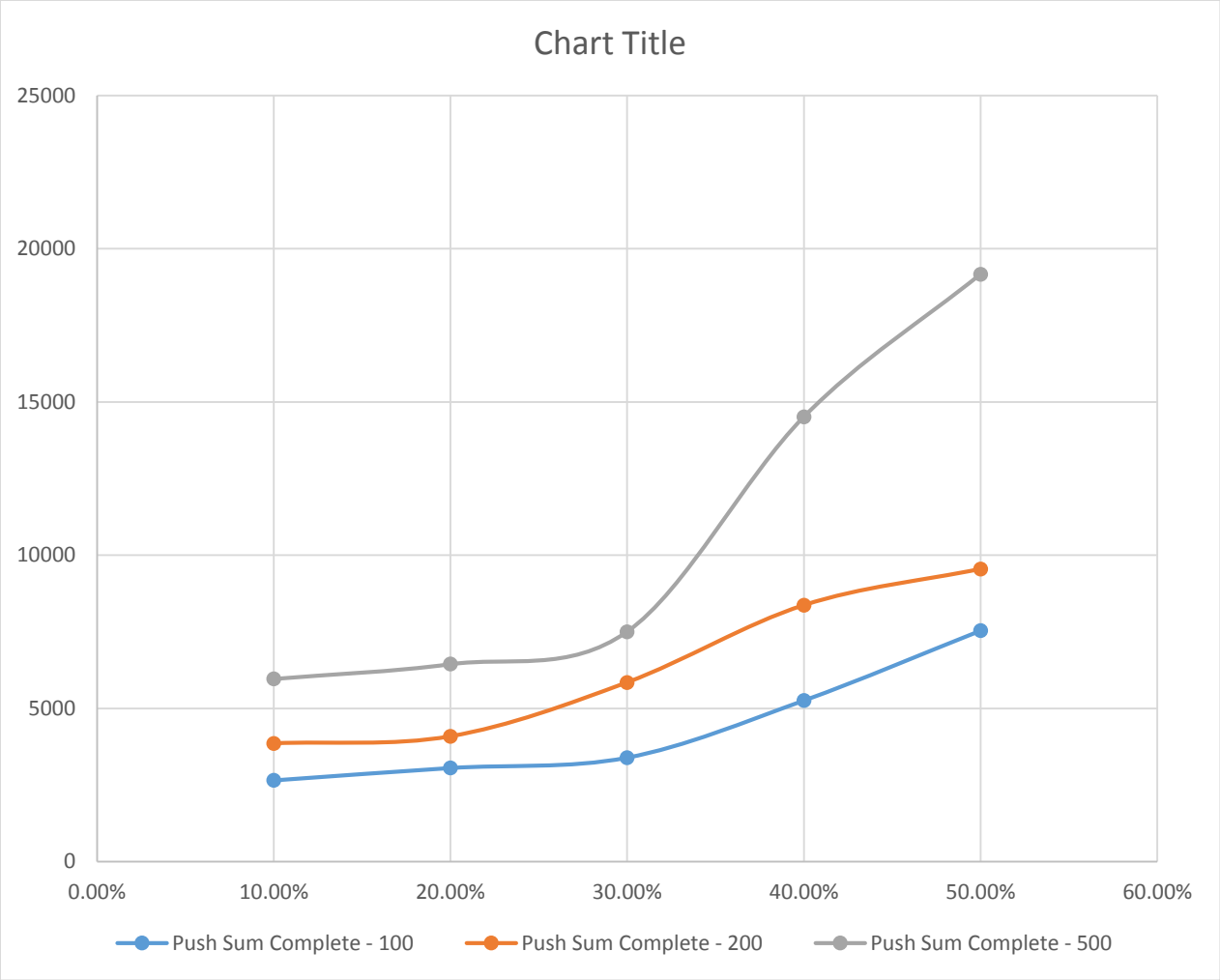
Chart Title
25000
20000
15000
10000
5000
0
0.00%
10.00%
20.00%
30.00%
40.00%
50.00%
60.00%
Push Sum Complete - 100
Push Sum Complete - 200
Push Sum Complete - 500