

## **COP5615 – Fall 2014**

### **Project 2 – Report**

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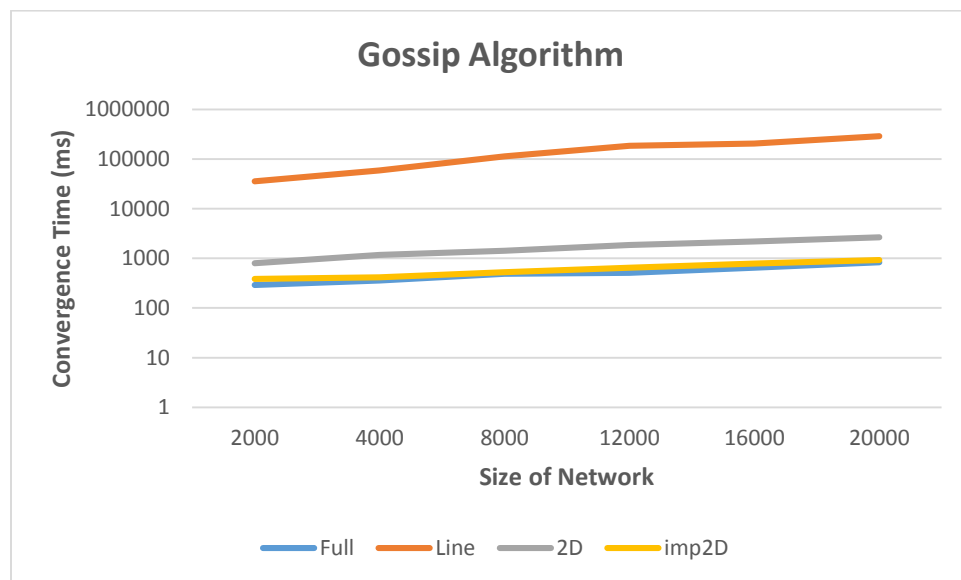
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### Gossip Algorithm:

Size of Network	Convergence Time (in milliseconds)			
	Full	Imp2D	2D	Line
2000	292	386	799	35593
4000	356	413	1180	59680
8000	492	531	1434	114388
12000	515	653	1863	185547
16000	649	791	2188	207887
20000	834	933	2648	288850



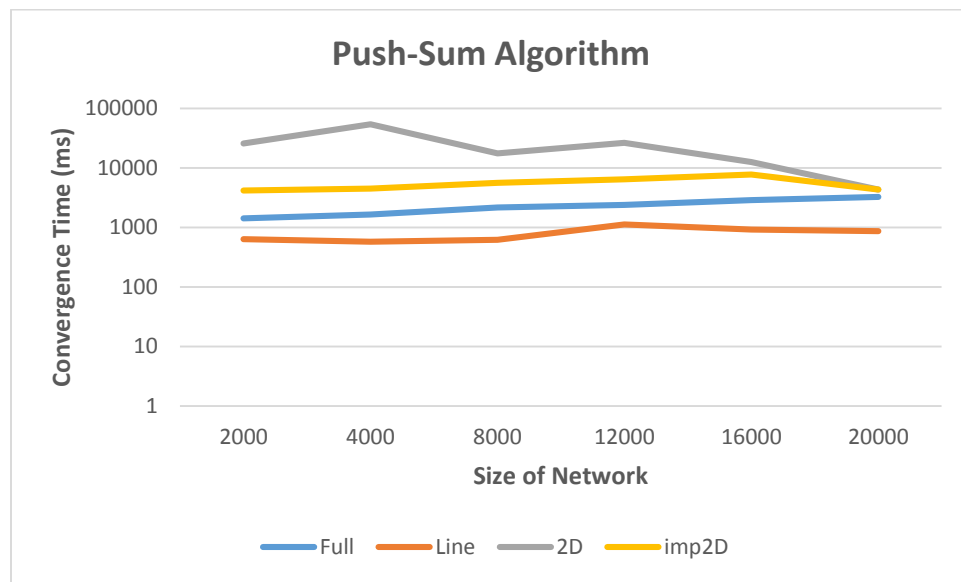
The above graph represents the convergence time for each of the topologies with different network sizes using Gossip algorithm.

### Analysis of Gossip Algorithm:

- The convergence time of full topology is the fastest when compared to other topologies (for various network sizes).
- The convergence time of line topology is the slowest when compared to other topologies (for various network sizes).
- The convergence time for full topology and imperfect 2D topology is almost similar.
- The topologies are listed below and are ranked according to their performance in Gossip Algorithm:
  - 1) Full
  - 2) Imp2D
  - 3) 2D
  - 4) Line

### Push-Sum Algorithm:

Size of Network	Convergence Time (in milliseconds)			
	Line	Full	Imp2D	2D
2000	632	1423	4170	25747
4000	575	1643	4458	53736
8000	617	2165	5598	17491
12000	1126	2385	6425	26252
16000	915	2858	7705	12446
20000	866	3257	4298	4319



The above graph represents the convergence time for each of the topologies with different network sizes using Push-Sum algorithm.

### Analysis of Push-Sum Algorithm:

- The convergence time of line topology is the fastest when compared to other topologies (for various network sizes).
- The convergence time of 2D topology is the slowest when compared to other topologies (for various network sizes).
- The convergence time of 2D and imperfect 2D topologies improves in case of larger networks.
- The performance of all the topologies according to their convergence times is as below:
- The topologies are listed below and are ranked according to their performance in Push-Sum Algorithm:
  - 1) Line
  - 2) Full
  - 3) imp2D
  - 4) 2D