Distributed Operating Systems Project 2 Gossip & PushSum

Author: Sitanshu Sukhmandir Lamba, UFID: 5190-8991
Author: Darshan Dilip Kakwani, UFID: 5311-7117

In this project we have implemented Gossip as well as Push-sum algorithms for topologies of various sizes.

Gossip protocol dictates that each node will send a rumor to its neighbours. After the node has received the rumour n number of times (n is arbitrary) it will stop transmitting further. The set of neighbours for each node varies according to the topologies.

Push-sum algorithm states that each node or actor will maintain two quantities s and w. s = actornum initially and w = 1. The actor sends half of its s and w to its neighbours and keeps the other half.

How to run the code:

"dotnet fsi --langversion:preview filename param1 param2 param3"

Filename is "main.fsx"
Param1: Number of nodes in the Topology.
Param2: Topology which is "full", "2D", "line" or "imp2D"
Param3: Algorithm which is "gossip" or "push-sum"

If there is an incorrect input the code will not run.
The code will give an output of how much time was required for the nodes to converge for the given topology and algorithm.

Largest Networks:

Gossip:

Full: 5000 nodes
2d: 5000 nodes
Imperfect2d: 5000 nodes
Line: 2000 nodes

PushSum:

Full: 2000 nodes
Imp2d: 2000 nodes
Line: 1000 nodes
2d: 2000 nodes