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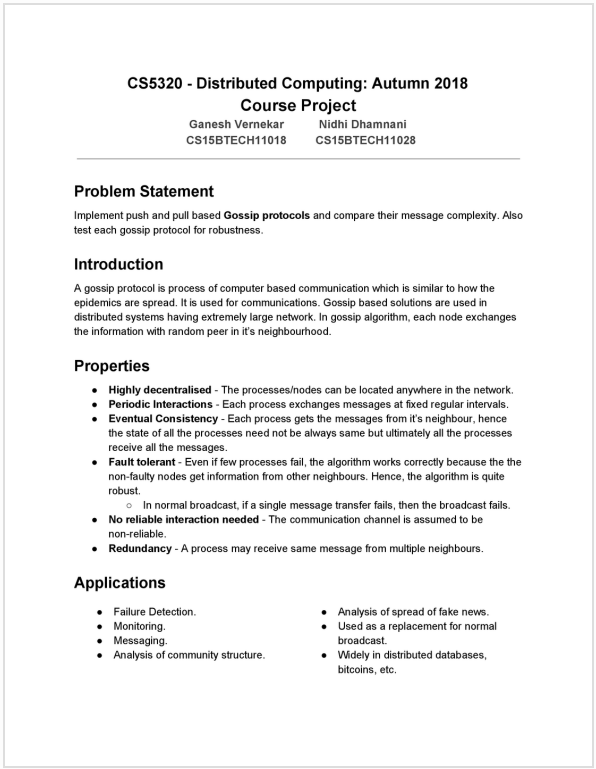

CS5320 - Distributed Computing: Autumn 2018
Course Project

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Problem Statement

Implement push and pull based **Gossip protocols** and compare their message complexity. Also test each gossip protocol for robustness.

Introduction

A gossip protocol is process of computer based communication which is similar to how the epidemics are spread. It is used for communications. Gossip based solutions are used in distributed systems having extremely large network. In gossip algorithm, each node exchanges the information with random peer in it's neighbourhood.

Properties

- **Highly decentralised** - The processes/nodes can be located anywhere in the network.
- **Periodic Interactions** - Each process exchanges messages at fixed regular intervals.
- **Eventual Consistency** - Each process gets the messages from it's neighbour, hence the state of all the processes need not be always same but ultimately all the processes receive all the messages.
- **Fault tolerant** - Even if few processes fail, the algorithm works correctly because the the non-faulty nodes get information from other neighbours. Hence, the algorithm is quite robust.
  - In normal broadcast, if a single message transfer fails, then the broadcast fails.
- **No reliable interaction needed** - The communication channel is assumed to be non-reliable.
- **Redundancy** - A process may receive same message from multiple neighbours.

Applications

- Failure Detection.
- Monitoring.
- Messaging.
- Analysis of community structure.
- Analysis of spread of fake news.
- Used as a replacement for normal broadcast.
- Widely in distributed databases, bitcoins, etc.