Research Collaboration

Racin, Dapeng, Danish

Research Topic 1

Title: Machine Learning based Reputation System for Proof-of-Storage in Decentralized Storage Network.

Context: Blockchain Storage, Reputation, Proof-of-Storage, System Efficiency

Problem: Current reputation systems are centralized/ partially decentralized or doesn’t exist in some decentralized storage technologies.

Solution:

- Accumulate responses in blockchain and train the ML model to predict the future behavior of nodes.
- Novel ML based decentralized reputation system.

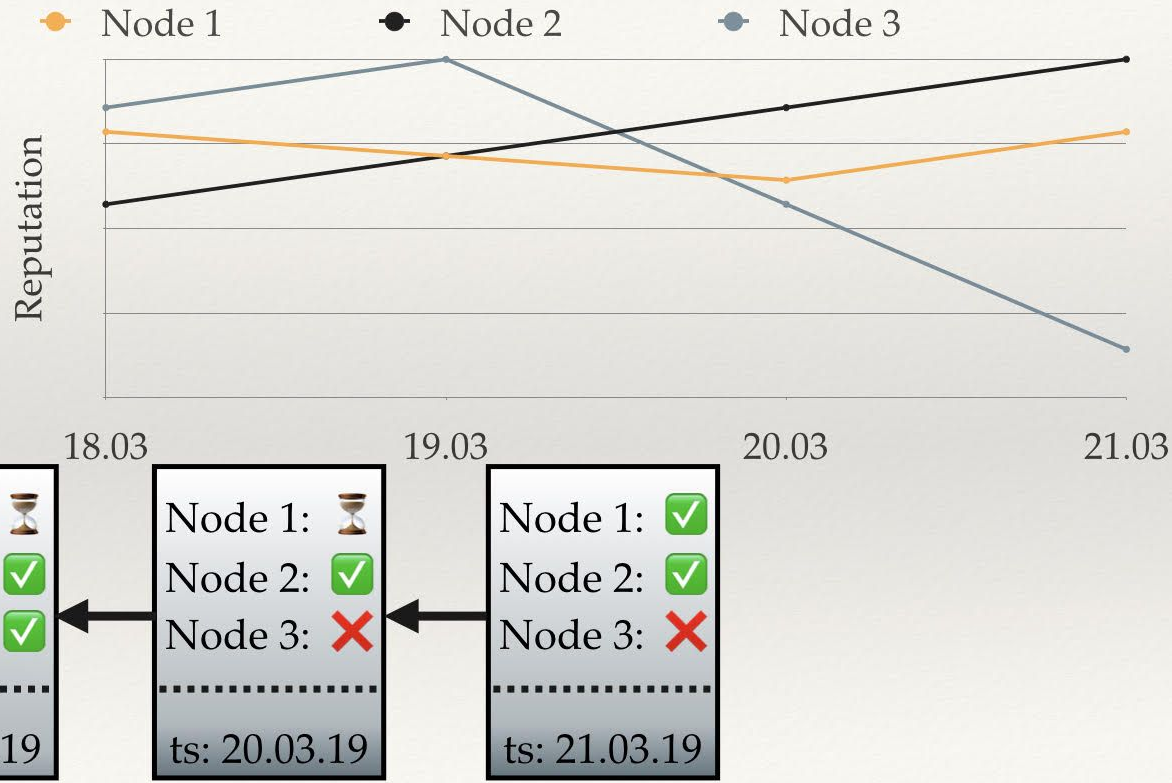
Collaboration

- Dapeng will work on Machine Learning part.
- Danish will work on the problem formulation and Reputation modelling.
- Racin will work on Proof-of-Storage and implementation.

- Work is planned to be completed in 3 months.
- 1 month literature review and problem formulation.
- 1 month implementation.
- 1 month paper writing.

Building reputation

✅	+x
⏳	-y
❌	-z



Research Topic 2

Title: A decentralized blockchain-based adaptive middleware for optimal data storage selection.

Context: Blockchain, Optimization, Decentralization, Trust, Fog network.

Problem: Fog nodes are owned by companies and cannot be trusted. The middleware are centralized.

Solution:

- A decentralized fog based architecture.
- Permissioned blockchain network of fog nodes.
- Distributed decision.

Collaboration

- Dapeng will work on Edge network and IoT testbed implementation.
- Danish will work on the analytical problem formulation and solution and decentralized storage technologies.
- Racin will work on prototype implementation of decentralized storage technologies.

- Work is planned to be completed in 3 months.
- 1 month literature review and problem formulation.
- 1 month implementation.
- 1 month paper writing.

Research Topic 3

Title: Blockchain based Distributed Service Placement for Fog-Cloud Platform in Smart cities.

Context: Blockchain, Optimization, System Efficiency, Federated Machine Learning.

Problem: Optimization challenges when come to service placement, migration. The decision process are centralized.

Solution:

- A multi-cloud architecture.
- Permissioned blockchain network of fog nodes and clouds.
- Distributed ML.

Collaboration

- Dapeng will work on Edge network and IoT testbed implementation.
- Danish will work on the analytical problem formulation and solution and multi-cloud aspects.
- Racin will work on permissioned blockchain and implementation.

- Work is planned to be completed in 3 months.
- 1 month literature review and problem formulation.
- 1 month implementation.
- 1 month paper writing.