



Bachelor Thesis Description

Implementing a Distributed Reliable Database

Description

piChain is a fault-tolerant distributed state machine which inherits features of Paxos [1], providing strong consistency, and of a blockchain [2], providing eventual consistency and simplicity. The goal of this thesis is to implement the proposed algorithm and make it available to others in the form of a library. For example the library can be used to keep replicas of a distributed data storage consistent in case of failures.

Project Outline

- Implementing the basic algorithm in a fully connected network ★★
- Reducing the number of messages by flooding in an overlay graph ★
- Implementing a reliable replicated database utilizing the library ★★
- Evaluating the results in form of a written report ★

Organization

Duration: 6 months

Professor: Prof. Dr. Roger Wattenhofer

Supervisor: Conrad Burchert

References

[1] Leslie Lamport. 1998. The part-time parliament. *ACM Trans. Comput. Syst.* 16, 2 (May 1998), 133-169.

[2] S. Nakamoto. Bitcoin: A peer-to-peer electronic cash system, 2008.