Prüfung: Blockchain Technologies

Prüfer: Prof. Dr. Florian Tschorsch

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1. Serialization vs. 2PL
    - How do they work
    - What are the weaknesses
    - Example scenario: one node fails (any node). Probability is equal. Which alrorithm is more dangerous in this scenario? (Answer: 2PL)
2. Types of Failures:
    - Fail-stop
    - Fail-recover
    - Byzantine
3. Explain Byzantine failure: types, why is it different from the others
4. Problem of Byzantine general and lieutenants
5. Oral messaging algorithm: apply on the example:
    - Nodes: A, B, C, D
    - Messages: North, West, South, East
    - A, B want to go North
    - C wants to go South
    - D is Byzantine: he tells A and B to go East, and to C – South
    - Choose any of the nodes to be a commander
    - Apply the oral messaging algorithm and solve the problem
6. Scalability
    - Bitcoin problems regarding scalability
      My answer: transaction rate
    - Transaction rate formula + explanation.
    - What happens if we make the block size bigger or reduce the block generation time?
    - Why shouldn't we do it (give exact explanations)
      Couldn't explain very good why is it bad if the block size will increase so he asked on an example of a network what will happen if one part of the network will be busy propagating a big block?
      Answered: an attacker could have more time to propagate his false information/block in the rest of the network. Mentioned selfish mining.

    - Explain selfish mining and reasons behind it. Why doesn't the selfish miner publish his block immediately after mining it?