



UNIVERSITÄT PADERBORN
Die Universität der Informationsgesellschaft

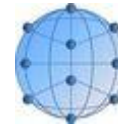


**Theory of
Distributed Systems**

PG ROTRANS: Robust Distributed Transaction System

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Motivation

Distributed transaction systems have many important applications:

- **Multithreaded programming**
- **Distributed data bases**
- **Booking services**
- **Crypto currencies**
- ...



Transactions

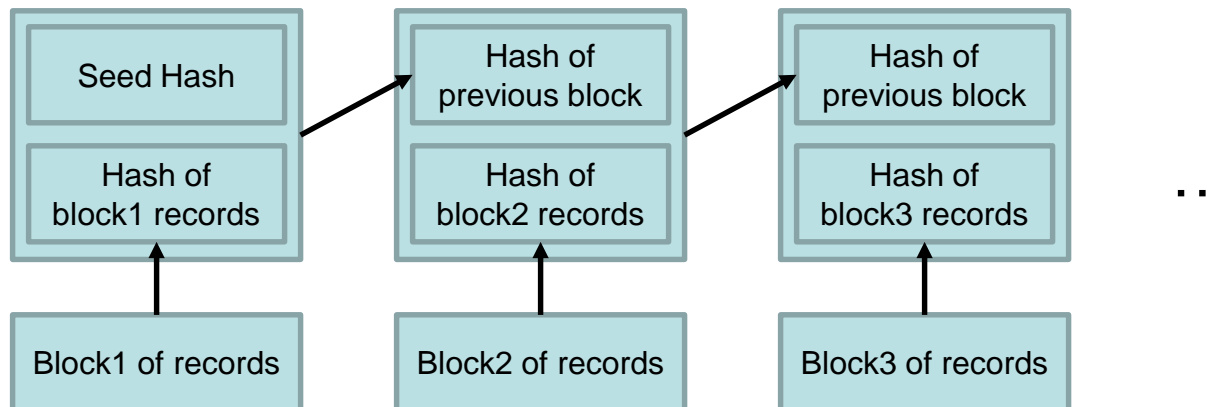
Standard requirements: **ACID**

- **Atomicity**, i.e., transactions must either be processed **completely or not at all**
- **Consistency**, i.e., the execution of a transaction must **preserve the system invariants**
- **Isolation**, i.e., the execution of transactions leaves the system in a state that would have been obtained if the transactions were executed **sequentially**
- **Durability**, i.e., once a transaction has been committed, it will remain committed even in the case of a system **failure or attacks**

How to ensure these requirements has been subject of intense research and development efforts.

Transactions

New trend for transactions in untrusted distributed environments:
Blockchains



Main application: crypto currencies (Bitcoins, Ethereum,...)

Problem: current approaches do not scale well!

Goal of the Project Group

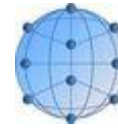
Goal: Design a **robust distributed system for financial transactions.**
(Important for Collaborate Research Project SFB 901)

Theoretical aspects (first semester):

- **Make yourself familiar with state-of-the-art research on approaches for distributed transactions in untrusted distributed environments.**
- **Optionally, adapt existing and/or design new algorithmic and cryptographic primitives.**

Practical aspects (second semester):

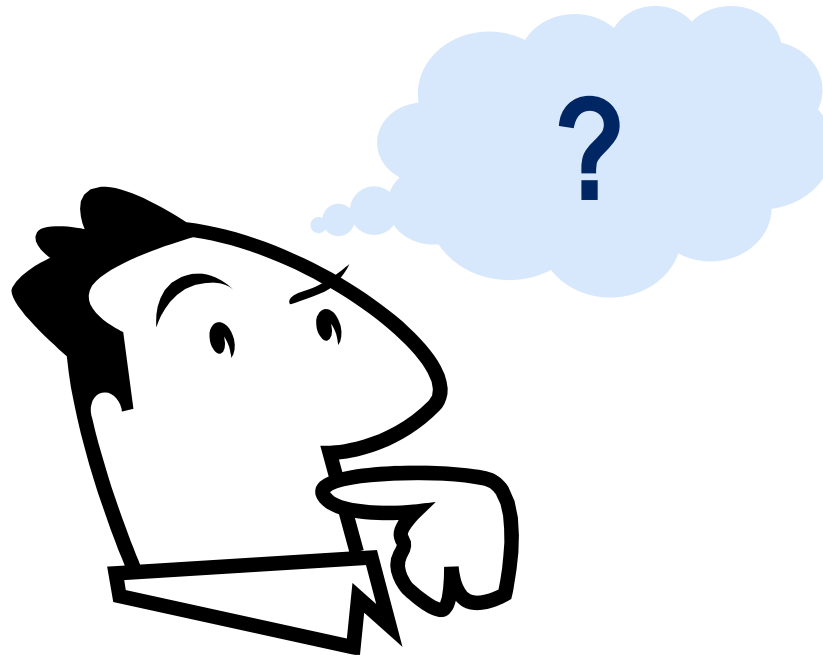
- **Implement (improved) state-of-the-art approaches.**
- **Experimental evaluation.**



Prerequisites

What we expect from you:

- **Experience with distributed systems (practical or theoretical)!!**
- **Ability to understand scientific papers**
- **Basic programming skills**
- **High motivation (crypto currencies are a cool topic!)**



Questions? Talk to us!