1 Motivation

In the TAST project, we are researching various questions within blockchains and smart contracts. We have developed two protocols for transferring tokens between blockchains, a task which is so far unexplored in other research.

Building on the token transfer approaches we have previously developed, we would now like to extend the functionality to calling smart contract functions on one blockchain from within another blockchain. This poses several requirements, starting at the conceptual level, touching questions regarding timing and performance, and going all the way down to technical aspects like data formats. The calls should invoke functions including parameters, and pass returned values back to the caller. The feasibility of also propagating raised events to the calling blockchain should be analyzed.

This thesis topic involves the design and prototypical implementation of smart contract calls across blockchains. The student is expected to use concepts developed within the TAST project which are used for token transfers, and apply them to smart contract invocation.

2 Work Description

- Analysis of candidate blockchains for implementing cross-blockchain smart contract calls.
- Design of a conceptual architecture for such calls.
- Prototypical implementation of a smart contract and its calls from other blockchains.
- Evaluation of the new implementation with regards to aspects including speed, cost, and security.

3 Further Information

Start: Immediately (might also be later)

Basic Requirements: Knowledge in the blockchain field is required; experience with smart contracts is very helpful; eagerness to gain knowledge in new technologies

TAST Website: [http://www.infosys.tuwien.ac.at/tast/](http://www.infosys.tuwien.ac.at/tast/)

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