Seminar Thesis

A solidity smart contract for rental deposit accounts

Matthias Nadler

Supervised by:
Prof. Dr. Fabian Schär
Credit Suisse Asset Management (Schweiz) Professor for
Distributed Ledger Technologies and Fintech
Center for Innovative Finance, University of Basel

Abstract

TEMP: Analyze the incentive structure of the current rental deposit account situation and devise a DAI powered smart contract that will attempt to improve on it.

Keywords: Ethereum, smart contract, DAI, rental deposit account.
JEL: G21, G52, G19

Contents

Plagiatserklärung

Ich bezeuge mit meiner Unterschrift, dass meine Angaben über die bei der Abfassung meiner Arbeit benutzten Hilfsmittel sowie über die mir zuteil gewordene Hilfe in jeder Hinsicht der Wahrheit entsprechen und vollständig sind. Ich habe das Merkblatt zu Plagiat und Betrug vom 22. Februar 2011 gelesen und bin mir der Konsequenzen eines solchen Handelns bewusst.

Matthias Nadler

1 Introduction

Short overview of the problem we try to solve. Mention Ethereum and DAI, but don't go in-depth.

2 Analysis of current incentive structure

Analyze current deposit account contracts and work out incentives for each party.

2.1 Tenant incentives

Discuss tenant incentives and areas to improve situation.

2.2 Landlord incentives

Discuss landlord incentives and areas to improve situation.

2.3 Trustee incentives

Discuss trustee (bank, notary, depositary, ...) incentives and areas to improve situation.

3 Multisig on Ethereum

Describe the problem of multisig on ethereum. And explore possible implementations.

3.1 Off-Chain implementation

Sign transactions off-chain and then send the signed data to the contract.
SWOT analysis

3.2 On-Chain implementation

Multiple approaches exist

3.2.1 Transactions as struct

SWOT analysis, multiple transaction types (GNOSIS Ltd. (2019))

3.2.2 Minimal state approach

SWOT analysis, work with signatures

3.3 Conclusion

Present selected approach with additional details.

4 Designing the smart contract

Work out the functionality of the smart contract in pseudo code.

4.1 Multisig design

How we do multisig

4.2 Deposit account functionality

Functions related to the deposit account management

5 Implementation

Software development philosophy.

5.1 Environment

Tools used

5.2 Testing

Testing approach and coverage

6 Discussion

Discussion of result and potential applications

References

GNOSIS Ltd. (2019), 'gnosis/MultiSigWallet: Allows multiple parties to agree on transactions before execution.'.
URL: *https://github.com/gnosis/MultiSigWallet*