Challenge Task 2018

Implementation of a Decentralized Application Tic Tac Toe

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INTRODUCTION

This years Challenge Task is to implement a Decentralized Application (DApp) running in the Ethereum blockchain. The goal of the application is a playable Tic-Tac-Toe [1] game, which also includes a betting system, all embedded in a Smart Contract.

Chapter 2 gives an overview and short explanation of the technologies we use in order to implement the Challenge Task.

In Chapter 3 we show the actual implementation of the game. It starts by explaining and showing our project structure. Also we give walk-through of the different processes of playing a game and betting on games.

The problems and challenges occurred within our project are discussed in Chapter 4. Additionally we also describe our open task and goals for the future concerning this project.

[1] https://en.wikipedia.org/wiki/Tic-tac-toe

Chapter 2

TECHNOLOGIES

With Solidity [1] we implement the smart contract which will run on the Ethereum blockchain platform. For our front-end we choose using React [2] , which is a JavaScript library for building user interfaces. The interaction of the front-end application with our smart-contract is provided through Web3.js [3] and MetaMask [4] . To speed up the testing and development we use Ganache [5] to run our local Etherum blockchain In the following section we describe the different technologies and its use in our project more in detail.

2.1 Solidity

2.2 Web3.js

2.3 MetaMask

2.4 Ganache

[1] https://github.com/ethereum/solidity

[2] https://reactjs.org/

[3] https://web3js.readthedocs.io/en/1.0/

[4] https://metamask.io/

[5] http://truffleframework.com/ganache/

Chapter 3

IMPLEMENTATION OF THE GAME

3.1 Project Structure

3.2 Game Walk-through

Chapter 4

DISCUSION

4.1 Challenges and Problems

4.2 Future work

APPENDIX A

RAW DATA