
ERC777 the new token standard, and trust-less payment channel tokenized loyalty points

Master's Thesis submitted to the
Faculty of Informatics of the *Università della Svizzera Italiana, Switzerland*
in partial fulfillment of the requirements for the degree of
Master of Science in Informatics

presented by
Jacques Dafflon

under the supervision of
Prof. Cesare Pautasso
co-supervised by
Mr. Thomas Shababi

June 2018

I certify that except where due acknowledgement has been given, the work presented in this thesis is that of the author alone; the work has not been submitted previously, in whole or in part, to qualify for any other academic award; and the content of the thesis is the result of work which has been carried out since the official commencement date of the approved research program.

Jacques Dafflon
Neuchâtel, 20 June 2018

Abstract

This is a very abstract abstract.

Acknowledgements

ACKS

Contents

Contents	vii
List of Figures	ix
List of Tables	xi
1 Introduction	1
2 Ethereum, A Decentralized Computing Platform	3
3 Tokens, And The Current Standard ERC20	5
4 ERC777, A New Advanced Token Standard For Ethereum Tokens	7
5 Payment Channels	9
6 Tokenized Loyalty Points	11
7 Future Research and Work	13
8 Conclusion	15
Glossary	17

Figures

Tables

Chapter 1

Introduction

Introduce:

- Blockchain / Ethereum (briefly)
- Define Tokens, ERC20, the need for a new standard
- Introduce ERC777
- Define payment channels and reason for existence, use as credit card
- Define loyalty points for credit cards

Chapter 2

Ethereum, A Decentralized Computing Platform

Short chapter explaining the following concepts:

- Ethereum Blockchain
- Smart contracts

Chapter 3

Tokens, And The Current Standard ERC20

Short description of tokens and their use.

Explain ERC20:

- specifications
- issues (vulnerabilities, locking)
- examples of attacks and locked funds

Mention ERC223 and its own problems:

- tokensFallback on all contracts
- not backwards compatible with ERC20
- unusable by existing contracts
- community/human issues with the author

Chapter 4

ERC777, A New Advanced Token Standard For Ethereum Tokens

Explain ERC777 in thorough details:

- specifications
- ERC820
- TokensSender and TokensRecipient
- Operators
- ERC20 compatibility
- Collaboration with Jordi Baylina
- Public Reception

Chapter 5

Payment Channels

- Speed Issues With The Blockchain
- Off-chain Solutions (Basic Explanation of Payment Channels)
- Use Cases
- Current Implementation And Improvements Made

Chapter 6

Tokenized Loyalty Points

- Basic Idea of Loyalty Points From Payment channels
- Tx Based Tokens
- Volume Based Tokens
 - modifications to the payment channel
- Redeeming process
 - Burning strategies
 - by the token contract
 - allowed set of “burners” (contracts of the loyalty program)
 - anyone

Chapter 7

Future Research and Work

- ERC777
 - Generic operators
 - Generic TokensSender And TokensRecipient
 - Promote ERC777
 - Assist In The Implementation of ERC777 Technologies (Wallet, Exchanges, Blockchain Explorers)
- Payment Channel
 - Other use cases for tokens (actually voting with your wallet)
 - Tax deductions on some tx (add tag in payment channel?)
- Loyalty Programs
 - On chain (ETH rewards, tokens Rewards, Pay with Tokens)
 - Off chain (T-shirts, coffee machines and toasters)

Chapter 8

Conclusion

I'll do this one at the end

Glossary