Mining and transaction of Ethereum

November 15, 2018

1 Introduction

Following the first lab, the second one will ask you to do mining and transactions on the Ethereum blockchain set up in the first lab. This document gives you a step-by-step instruction for that purpose. The procedure has been exhaustively tested by the TAs on Ubuntu 18.04. It should also work on other Linux distributions as well as Mac OS. Please direct your questions, if any, to You Li, our TA for the labs.

2 Mining

Before you start, please make sure your node is connected to several peers, so that your results will get broadcasted.

2.1

Restart your node:

Load the genesis file:

*geth --datadir node*yourname* init genesis.json*

Start your node:

*geth --datadir node*yourname* --port 30000 --unlock '0' --password ./node*yourname*/password console*

2.2

Start mining:

miner.start()

It will take some time to generate DAG on your machine.

2.3

Stop mining:

miner.stop()

2.4

Check your balance:

web3.fromWei(eth.getBalance(eth.accounts[0]),'ether')

3 Send transaction

3.1

Preparing for transaction.

Make sure you have enough balance in *eth.accounts[0]*, and sender and receiver are peers to each other..

Initialize sender:

var sender = eth.accounts[0]

Initialize receiver:

*var receiver = "*receiver_account*"*

Initialize amount:

var amount = web3.toWei(1, "ether")

Unlock sender's account:

personal.unlockAccount(eth.accounts[0])

3.2

Send transaction.

eth.sendTransaction(from: sender, to: receiver, value: amount)

Record the returned transaction hash value, so that you can check your transaction after it is mined by a miner.

3.3

After the next block is mined, you can check the transaction:

eth.getTransaction("transaction_hash_value")

4 Assignment

4.1

Tasks:
(1) Earn at least 30 ethers through mining. Use the procedure described in section 2.4 to show your result.
(2) Send 1 ether to another student in class. Use the procedure described in section 3.3 to show your result.
(3) Receive 1 ether from another student in class. Use the procedure described in section 3.3 to show your result.
(4) In Lab 1, you are asked to set up another account without initializing the *genesis*. You may notice that it would synchronize blocks for a long time or at a higher rate, and peers may even appear automatically. Can you explain why?

4.2

Requested submissions:
(1) A screenshot to task (1).
(2) A screenshot to task (2).
(3) A screenshot to task (3).
(4) Your answer to task (4).