# Ethereum Blockchain Mempool Activity Recorder

Abstract

The popularity of the cryptocurrency Bitcoin attracts attention to its underlying technology, the Blockchain. A Blockchain is a databases based on chain of blocks, and each block is composed of set of transactions. To form a new block at the top of the chain, nodes in the system share new transactions between them, until one of them can pack a set into new block. For that, nodes in the network maintain a local pool of pending transactions, usually called 'mempool'. Mempool synchronization takes major part of the network bandwidth, hence it is valuable to find an efficient algorithm for it.
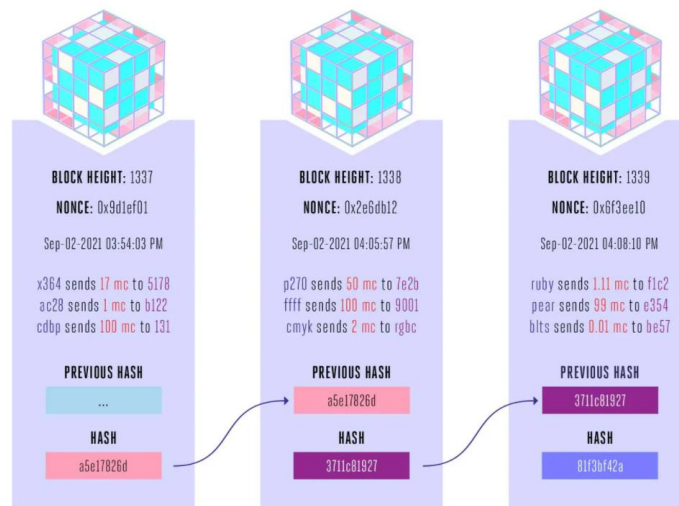
Problem

We want to be able to study the differences between mempools of different Ethereum nodes over time. Therefore, the synchronization algorithm should be based on statistics from real-world data, preferably the Ethereum network.

Objective

Generate a transaction dataset that contains arrival times for at least two Ethereum nodes and analyze it.

Project Overview

1. Blockchain crash-course. Blocks, transactions, mining, Bitcoin, Ethereum, etc.

2. Download source code of Ethereum client. For example, [Go Ethereum](#).
3. Edit the code and add transaction mempool tracking mechanism
4. Write traced data periodically to the disk
5. Run several nodes that implement the added transaction mempool tracking mechanism.
6. Collect the recorded data and join the results
7. Analyze the new dataset:
    a. Per-transaction time difference statistics: Average etc.
    b. Mempool differences over time

Notes

- The above list is an estimate. Goals and tasks might be modified during the first few weeks of the projects before the finalization of High Level Design Document.
- General requirements for all LCCN Projects are specified at the lab website: https://lccn.cs.technion.ac.il/lab-courses/

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