## Bandwidth-Efficient and Storage-Efficient Blockchain on Hyperledger Fabric

Abstract—Bitcoin network

Index Terms—Bitcoin Network, Mining Pools, Malthusian Trap, Incentive Mechanism

## 1 Introduction

ITCOIN [1] is a decentralized peer to peer (P2P) Dcryptocurrency that was first proposed by Satoshi Nakamoto in 2008. Without resorting to any trusted third party, Bitcoin adapts a cryptographic proof mechanism that enables anonymous peers to complete transactions through the P2P network. Blockchain is the core mechanism of the Bitcoin system. It not only records historical transactions from Bitcoin clients, but also prevents the Bitcoin network from double spending attacks [2]. The Bitcoin network participants, who maintain and update the ongoing chain of blocks, are called miners. These miners compete in a mining race driven by an incentive mechanism [3], [4], where the one who first solves the Bitcoin cryptographic puzzle [5] has the right to collect unconfirmed transactions into a new block, append the new block to the main chain, i.e., the longest chain of blocks, and gain some BTCs [6] as a mining reward.

## 2 Solo Orderer Mode

The configuration file, i.e., configures the orderer service as follows.

BatchTimeout: 2s

2 BatchSize:

3 MaxMessageCount: 10

AbsoluteMaxBytes: 98 MB

PreferredMaxBytes: 512 KB

Case 1 without considering block size, we have the following model,

$$BlockTime = \begin{cases} \infty & TAR = 0\\ BatchTimeout & 0 < TAR \le \frac{MaxMessageCount}{BatchTimeout}\\ \frac{MaxMessageCount}{TAR} & S_R \le 0 \end{cases}$$
(1)

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