CLAIMS

1. A computer-implemented method for managing a blockchain-based centralized ledger system, the method comprising:

transmitting a first timestamp request for a first to-be-timestamped block of a blockchain in the centralized ledger system at a first time point to a trust time server by a computing device in the centralized ledger system, the trust time server being associated with a trust time authority and independent from the centralized ledger system, the blockchain comprising a plurality of blocks storing transaction data;

in response to determining that a predetermined time period has lapsed after the first time point and that there has been no reply to the first timestamp request from the trust time server, disregarding the first timestamp request by the computing device; and

in response to determining that a second block immediately subsequent to the first to-be-timestamped block in the blockchain is to be generated at a second time point later than the first time point but before the predetermined time period has lapsed and that there has been no reply to the first timestamp request from the trust time server at the second time point, postponing generating the second block in the blockchain by the computing device.

2. The method of claim 1, further comprising:

in response to determining that the predetermined time period has lapsed after the first time point and that there has been no reply to the first timestamp request from the trust time server, resuming to generate the second block in the blockchain by the computing device.

3. The method of any preceding claim, wherein disregarding the first timestamp request comprises:

in response to receiving a reply to the first timestamp request from the trust time server after the predetermined time period, disregarding the reply.

4. The method of any preceding claim, wherein the computing device is configured to periodically transmit timestamp requests for to-be-timestamped blocks in the blockchain to the trust time server with a predetermined triggering time period.

5. The method of claim 4, wherein the predetermined triggering time period is associated with a corresponding cost for a timestamp service of the centralized ledger system.

6. The method of claim 4 or 5, wherein the predetermined triggering time period is predetermined by a user associated with the centralized ledger system.

7. The method of any preceding claim, wherein the first timestamp request for the first to-be-timestamped block of the blockchain comprises a hash of the first to-be-timestamped block of the blockchain.

8. The method of any preceding claim, further comprising:

transmitting a second timestamp request for a second to-be-timestamped block of the blockchain to the trust time server by the computing device;

receiving a second timestamp and an associated signature for the second to-be-timestamped block within the predetermined time period from the trust time server by the computing device; and

storing information of the second timestamp and the associated signature for the second to-be-timestamped block in the blockchain by the computing device.

9. The method of claim 8, wherein storing information of the second timestamp and the associated signature for the second to-be-timestamped block in the blockchain comprises:

storing at least one of the second timestamp and the associated signature or a hash of the second timestamp and the associated signature for the second to-be-timestamped block in a third block immediately subsequent to the second to-be-timestamped block in the blockchain, wherein the third block stores a hash for the second to-be-timestamped block.

10. The method of claim 9, wherein a block body of the third block comprises no other transaction data except the at least one of the second timestamp and the associated signature or the hash of the second timestamp and the associated signature for the second to-be-timestamped block.

11. A system for managing a blockchain-based centralized ledger system, the system comprising:

one or more processors; and

one or more computer-readable memories coupled to the one or more processors and having instructions stored thereon that are executable by the one or more processors to perform the method of any of claims 1 to 10.

12. An apparatus for managing a blockchain-based centralized ledger system, the apparatus comprising a plurality of modules for performing the method of any of claims 1 to 10.