CLAIMS

1. A computer-implemented method for processing blockchain data by a blockchain node of a blockchain network in a trusted execution environment (TEE), the computer-implemented method comprising:

receiving a request from an application component of the blockchain node to execute one or more software instructions in the TEE;

determining one or more blocks stored on the blockchain node suitable for executing the one or more software instructions, wherein the one or more blocks are stored on the blockchain node and appended to the blockchain network;

performing error correction coding of the one or more blocks in the TEE to generate one or more encoded blocks;

dividing each of the one or more encoded blocks into a plurality of datasets based on the one or more software instructions;

selecting one or more datasets from the plurality of datasets of each of the one or more encoded blocks based on the one or more software instructions to generate one or more selected datasets;

hashing the one or more selected datasets to generate one or more hash values corresponding to the one or more selected datasets, the one or more hash values being used for replacing the one or more selected datasets to save storage space of the blockchain node;

storing the one or more hash values and a remainder of the plurality of datasets not selected from the plurality of datasets to the blockchain node, wherein the one or more selected datasets corresponding to the hash values are stored on at least one different node of the blockchain network; and

instructing the blockchain node to delete a block corresponding to the one or more hash values and the remainder of the plurality of datasets after the one or more hash values and the remainder of the plurality of datasets are stored on the blockchain node.

2. The computer-implemented method of claim 1, the blockchain node is a first blockchain node and the one or more encoded blocks are first one or more encoded blocks, the computer-implemented method further comprising:

receiving a request from a second blockchain node for data synchronization, wherein the request includes second one or more block IDs associated with second one or more encoded blocks, and the second blockchain node stores one or more hash values and one or more datasets corresponding to the second one or more encoded blocks; and

comparing the second one or more block IDs associated with the second one or more encoded blocks with first one or more block IDs associated with the first one or more encoded blocks to identify one or more block IDs included in only one of the first one or more block IDs and the second one or more block IDs.

3. The computer-implemented method of claim 2, wherein the TEE is a first TEE associated with the first blockchain node, and the computer-implemented method further comprising:

in response to identifying that the one or more block IDs are included in the first one or more block IDs, sending one or more encoded blocks corresponding to the one or more block IDs to the second blockchain node; and

in response to identifying that the one or more block IDs are included in the second one or more block IDs, instructing the first blockchain node to send a request to a second TEE associated with the second blockchain node to retrieve the one or more encoded blocks corresponding to the one or more block IDs.

4. The computer-implemented method of any previous claim, further comprising:

indexing each of the plurality of datasets with a block ID of a corresponding block of the one or more blocks.

5. The computer-implemented method of any previous claim, further comprising:

determining the one or more blocks as infrequently accessed blocks based on determining that the one or more blocks are appended to a blockchain for a predetermined amount of time or no block data associated with the one or more blocks are retrieved to execute a smart contract for a predetermined amount of time.

6. The computer-implemented method of any previous claim, wherein the error correction coding is performed when utilization rate of computational resource of the

blockchain node is less than or equal to a predetermined value or usage of storage space of the blockchain node is greater than or equal to a predetermined percentage.

7. The computer-implemented method of any previous claim, wherein the error correction coding is performed by adding redundant bits to the one or more blocks.

8. The computer-implemented method of any previous claim, wherein the error correction coding is erasure coding.

9. The computer-implemented method of any previous claim, wherein the request includes one or more input parameters and is received through an application programming interface associated with the TEE.

10. A system communicating shared blockchain data, 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 computer-implemented method of any of claims 1 to 9.

11. An apparatus for communicating shared blockchain data, the apparatus comprising a plurality of modules for performing the computer-implemented method of any of claims 1 to 9.