

What is claimed is:

1. A blockchain management apparatus comprising:
at least one hardware processor configured to:

5 implement a block generation order control unit which prevents a block generation node of a plurality of blockchain nodes from generating a new block of a blockchain in response to a determining, by the blockchain management apparatus, that if another block is generated by the block generation node within a unit section,
 wherein the unit section corresponds to a preset number of blocks measured from a
10 current block corresponding to a current block height of the blockchain, and
 the blockchain management apparatus manages a permission-based blockchain network including the plurality of blockchain nodes.

 2. The blockchain management apparatus of claim 1, wherein
15 when a first blockchain node of the plurality of blockchain nodes participates in the permission-based blockchain network, a first verification of a first permission of the first blockchain node is performed, and
 when the first blockchain node receives a first new block, a second verification of a second permission of a block generation node which generates the first new block is
20 performed.

 3. The blockchain management apparatus of claim 2, wherein the second permission is higher than the first permission.

25 4. The blockchain management apparatus of claim 1, wherein a verification of a second blockchain node included in the permission-based blockchain network is performed using permission information of the second blockchain node recorded in the blockchain.

5. The blockchain management apparatus of claim 1, wherein the preset number is updated by the blockchain management apparatus to a larger value when one or more block generation nodes are added to the plurality of blockchain nodes.

5 6. The blockchain management apparatus of claim 1, wherein the block generation order control unit is configured to control a block generation order, in response to a determining that a number of block generation nodes is equal to or less than a preset threshold value.

10 7. The blockchain management apparatus of claim 1, wherein the block generation order control unit is configured to set a control parameter having a value in a range of 0 to 1 to control generation of the new block by the block generation node, and the preset number of blocks is determined by the blockchain management apparatus based on the value of the control parameter and a number of block generation nodes.

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8. The blockchain management apparatus of claim 1, wherein the blockchain management apparatus further comprises a block generation period control unit configured to control a block generation cycle, by adjusting a difficulty of block generation.

20 9. The blockchain management apparatus of claim 8, wherein the block generation period control unit is configured to control a block generation cycle based on a frequency of branch occurrences on the blockchain during a preset period.

25 10. The blockchain management apparatus of claim 9, wherein the blockchain management apparatus further comprises a monitoring unit which receives information on the branch occurrence from a monitoring node, and

a frequency of the branch occurrence is calculated by the blockchain management apparatus based on the information, wherein the permission-based blockchain network includes the monitoring node.

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11. The blockchain management apparatus of claim 1, wherein the blockchain management apparatus further comprises a block size control unit configured to control a size of a generated block.

5 12. The blockchain management apparatus of claim 1, wherein a distributed database managed by a plurality of external storage nodes stores the blockchain, and wherein the plurality of blockchain nodes accesses the plurality of external storage nodes with respect to the blockchain.

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